THE AMERICAN

School Board Journal

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In This Issue:

★ **Registration Forecasting for Small Public School Districts** — *Larsen*

★ **A Genuinely Useful Community School**— *Pence*

★ **An Engineer's Ideas as to Postwar School-Building Heating and Ventilating** — *Lewis*

★ **Schools for Recreation for Tomorrow** — *Glover*

★ **One of the New York City Postwar School Buildings** — *Engelhardt*

VOLUME 110, NUMBER 1 JANUARY, 1945

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BUSINESS AND EDUCATION

War demands and needs have closely united the business and educational forces in winning the war. Education's contribution to winning the peace presents an even bigger job. The economic, social, and business interests all give the schools a most important place in the national postwar program. The viewpoint of business on education is expressed by the action of the Chamber of Commerce of the United States in adopting the following recommendations of its Committee on Education in connection with the report on "Dependence of Business on Adequate Education":

"That the Chamber staff urge every locality to promptly survey its educational level and comparable economic status, with a view to state-wide improvement of its educational functions.

"That educational institutions and organizations be advised as to the Chamber's recognition of the essential and vital part education plays in the advancement of the economic and social well-being of our whole people.

"That the American people be asked to examine their whole educational program so that through proper and adequate support thereof our high standard of living may be maintained and improved."

School administrators and the instructional forces are effectively meeting every wartime demand which is placed upon the schools and school facilities, and there can be no let-up in this effort until victory is ours.

Paralleling this effort the postwar plan of school operations is an important job that must be done now. It is especially important that the postwar building plans are completed and ready for construction as soon as the war ends.

The editorial articles and the advertising in this issue provide a comprehensive source of information and help in shaping your program.

JOHN J. KRILL

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The contents of this issue are listed in the "Education Index."

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THE AMERICAN
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Evaluate Before Building

W. L. Berkhof[1]

The current emphasis upon postwar school-building construction invites a consideration of evaluation techniques which may be used during the planning stage to assure the eventual erection of a building which will meet the demands of sound educational theory and practice as applied to the local community. This step in the planning is important in view of the fact that administrators and architects are today aware of the fact that the true measure of the completed building will be the faithfulness with which it reflects the educational ideals and objectives of the community in which it is erected and its utility in assisting the placing of these ideals into practice. The achievement of such functionalism must of necessity be based upon careful preliminary cooperative planning on the part of representatives of all groups in the community which are in any way related to the work of the school and upon a careful evaluation of the plans as they are evolved in terms of the utility desired. It is this second step in the process of planning to which attention is called.

The evaluation process designed to serve as a check on the planning should, in our estimation, be based, as far as possible, upon a set of principles which may be applicable to the local situation and which might be accepted as universally true. Such principles might well include the following list which should, however, in no sense of the word be considered exhaustive.

Seven Valuable Principles

1. *The new school building should be an expression of the philosophy of education of the school system and should facilitate placing the philosophy into practice.*

This broad statement presupposes, of course, a previous crystallization of thought regarding the nature of the educational process within the minds of administrators and staff members who undertake to evaluate, and also, a conviction on their part that this philosophy may through careful planning be translated into action. Criticism which might be voiced that this first principle is too broad to be of value may be answered by stating that its value lies in the emphasis it places upon the importance of a philosophy of education to school-building planning if a truly functional product is to be achieved.

2. *The building must be designed to meet the educational needs of* all *children and* all *adults in the community.*

This statement also presupposes a preliminary step on the part of those who desire to evaluate, namely, a careful consideration of the problem of the place of the school in the community. The importance of this step is evident when we consider that the value of a school building to a community is limited by the breadth of vision of those in charge of the educational program and that the tragedy of the erection of an inadequate school plant in terms of modern standards can be prevented only if the services which the school may render to the community have been thoroughly canvassed and then used as a guide and a check in the planning.

3. *Room design, equipment, and relationships should be planned to encourage the further development of the experience-type of program.*

The acceptance of this statement as a guiding factor in the planning is, of course, dependent upon the educational philosophy of those who plan. In this sense the statement may be looked upon as typical of those which are applicable to a local situation rather than being universally acceptable. In cases where it is acceptable, however, it centers attention upon the fact that room design, equipment, and relationships have an important bearing upon the translation of educational philosophy into practice.

Aesthetic and Administrative Functions

4. *Building design, construction, and appointments should serve as an educational influence in the aesthetic and social development of children.*

This statement is a natural corollary to the growing conviction among educators that the educational process extends far beyond the generally accepted teacher-pupil relationship to include all of the environmental factors which influence the lives of children. Among these factors the school building is, no doubt, of primary importance because of the central position which it occupies in the experiences of children during the impressionable period of youth. Specific planning and evaluation of the school plant and its site as an influential environmental factor is, therefore, an important consideration which will, no doubt, result in worth-while dividends particularly in the areas of the social, and aesthetic development of children.

5. *Building design and construction should facilitate administrative techniques and operation and maintenance procedures.*

The close relationship which exists between efficiency and the wise expenditure of the tax dollar makes this one of the most practical considerations in functional planning. While it is true that the efficiency of a school system is directly dependent upon the efficiency of its administration, the administrator may, in turn, be hampered by a school plant with a low efficiency potential. Inadequate administrative quarters and equipment and indiscriminate scattering of departmental units throughout the building are typical examples of such obstacles in the administrative area, while the haphazard selection and use of building materials and a failure to realize the importance of detail in construction and in room and equipment design are illustrative of the causes for unwarranted operation and maintenance costs. The fact that efficiency in these areas is immediately evident to all and will, therefore, play a large role in the judgment by the community of the building, makes a careful check on this phase of the planning of paramount importance.

Happiness, Health, and Safety

6. *Design, construction, and equipment should be planned with emphasis upon the health, happiness, and safety of children.*

The right of every child to health and happiness is nowhere recognized more clearly than in the American public school. The actual realization of this right within the school is, however, dependent, among other

[1]Superintendent of Schools, Tecumseh, Mich.

things, upon the care exercised in the planning and construction of the school plant and its equipment. Adequate ventilation and lighting, comfortable and properly constructed seating equipment, adequate cafeteria facilities, safety devices on machinery, sanitary plumbing installations, interior acoustical treatment, cheerful interior decoration, and adequate play and recreational facilities are but a few of the hundreds of items in a school plant which have a direct bearing upon the health and happiness of children. The comparative ease with which these characteristics may be evaluated through the medium of an abundance of available data precludes the possibility of any excuse for failure to perfect plans which will facilitate the full realization of this ideal in the school.

7. *New plant facilities should be planned with emphasis upon a functional relationship with existing plant and recreational facilities.*

True efficiency and economy in a school-plant expansion program can be achieved only if each new unit is planned as an integral part of the entire school system. Needless duplication of facilities, improper location in relation to existing school and recreational facilities, and the selection of inadequate school sites are but a few of the errors which may occur if no attempt is made to evaluate the new enterprises in relation with existing facilities. Judgments in these matters must, of course, be based upon a comprehensive knowledge of the community. Such factors as population trends, property valuation trends, and community traditions and aspirations are all valuable indices which must be utilized in the planning and evaluation. Failure to do so may well result in the construction of a building which fails to meet the needs and desires of the community or in the construction of a building which, because of needless duplication of facilities, may prove to be a burden upon the community.

A Pattern to be Followed

Granted that it is both possible and highly desirable to evaluate the utility of a school plant prior to construction, the question of techniques to be employed remains. The detailed solution to this problem, like that of the formulation of a list of statements or principles which would be applicable to a local situation, may, it is felt, be best developed by those who desire to evaluate. This procedure will encourage a further concentration of thought regarding the entire evaluation process on the part of administrators and others charged with measuring the functional qualities of a proposed building. Certain suggestions may, however, prove helpful and are, therefore, presented with this thought in mind.

In searching for a pattern which might be followed it appears that the evaluative procedure as developed by the Cooperative Study of Secondary School Standards and embodied in its Evaluative Criteria has great merit as a technique which could be applied to the problem at hand. An acceptance of this idea would necessitate, first of all, a consideration of the major functional aspects or areas in terms of which the proposed school plant is to be evaluated, and, secondly the preparation of an extensive check list of items which could be considered contributing factors within each area and to which ratings might be applied. The statements outlined above may, it is felt, be considered illustrative of the first step which, because of its basic character, merits thought and attention. The second step, namely the preparation of a check list, should be preceded by a review of scientific studies which shed light on the ideal in school-plant construction. Thus in dealing with the aspect of the relationship of the school plant to the health, happiness, and safety of children, it is vital that information be obtained regarding such factors as the advisable ratio of window to floor space, the ideal type and intensity of artificial lighting, noise as a disturbing factor in the school, the relationship of correct design in furniture to health, the influence of cheerful and varied interior decoration upon the dispositions of teachers and students, the requisite play area based on enrollment, safety devices within the school, and a host of other pertinent items which may be used in the preparation of the check list in terms of which the plans may be evaluated. This check list, which may be in the form of brief questions or statements, should be designed and organized to call attention to the degree to which the plans evaluated meet the ideal as revealed by the review of scientific studies. A graphic portrayal of the evaluation within each area and also for the program as a whole may be effected by applying a system of ratings to each item in the check list, the totals of which can then be portrayed through the use of a series of graphs which total (1) the ratings of the items for each aspect and (2) the final rating for the program in its entirety. Data tabulated in this manner simplifies the problem of recording the results of the survey, and, the fairly accurate picture which it presents may also prove valuable as a public-relations instrument.

Some Final Difficulties

In presenting these suggestions regarding evaluation techniques full cognizance is taken of the fact that there are many factors which may invalidate, in a measure, the results of the survey. The lack of a set of objective standards which could be universally applied, the subjective complications arising out of the fact the the same person or persons responsible for the planning may also be assuming leadership in the evaluation, and the problem of clarifying the relationship of function to such comparatively abstract things as educational philosophy and community aspirations are but a few of the difficulties which must be taken into account. These difficulties should not, however, blind us to the fact that the values for those who make the survey are largely the result of the evaluation process itself rather than of its findings and it is on the basis of this fact that the suggestion is made to *evaluate before building.*

After the war physical education is certain to become of greater importance in the secondary school program. This will mean that gymnasiums like that of the Fairfield, Iowa, High School, illustrated on pages 23 to 27, will become centers of full-time use. The Fairfield gymnasium which has fold-back seats, is finished in colored tile wainscoting, concrete block walls, and hard maple floor.

Registration Forecasting for Small Public School Districts

*Harold T. Larsen**

Specialists concerned with engineering works of nationwide importance are acutely aware of the consistent warnings of census agencies that population curves are approaching a level. Planners of water-supply and sanitation facilities, of housing projects, airlines, motor ways, and of waterways — all begin their studies with a careful estimate of the future population load. Can scientific population forecasting be applied to the planning of public school districts? And, if so, to how small a school district can it be applied with profit?

Census compilations are the data of predominant importance in the prediction of world-wide population growth, whereas in some small political subdivisions, such as a suburban school district, various influences (a new industry or the sudden depletion of a natural resource) may overwhelm the biological trend by causing unpredictable migrations to or from the area. In every community, large or small, where dollar value is demanded by taxpayers, however, no data will be ignored. To decide how large a wing, how big a schoolhouse, or how many school buildings to build, a public school planner must somehow pass judgment on future years and estimate how many students will be demanding space when the district has reached its optimum growth. For better or worse, dollars are spent on this pronouncement.

Causes of Growth

When economic opportunities have remained constant for a fairly long period, the normal condition for a colony of life is a fluctuation in the population curve over and under some mean horizontal value; in other words, population tends to remain constant. A new increase in economic opportunity (a new source of food available, for example) causes the population to take an upward S-shaped path which eventually becomes level at a higher, fixed, "horizontal" population. Thereafter, the population tends to stay level at the new total as long as the "feeding impulse" remains constant. In other words, the community has reached its saturation point, or its maturity, under the given growth pattern. This is an expression of the so-called Verhulst theory as later defined mathematically by the logistic (S-shaped) curve of Pearl and Reed.

In presenting a curve of world population, C. J. Velz[1] has demonstrated this hypothesis on an heroic scale. Prior to the discovery of America, world population had remained fairly constant at an estimated total of 500,000,000. The age of discovery and invention that followed supplied an impetus — an economic opportunity — a "feeding impulse" — that sent the world population upward along its S-shaped path to its present estimated value of about 2,000,000,000. With the help of a practical tool, which is a simple graphic method, suggested by Professor Velz, it is possible to estimate that the saturation point of the present growth impulse will be approximately 2,700,000,000, and that this point is approaching rapidly. Thereafter, until a new "feeding impulse" appears, the population curve of world population will settle down to a humdrum, lazily oscillating level. Possibly nothing short of converting sunlight or water or air into easily usable fuel will start another upward flight — that is, supply a new "feeding impulse."

Characteristics of School Growth

Admittedly, it is a far cry from the ideal, all-inclusive scope of world population to the suburban community of, say, 10,000 population appended as a "bedroom" to a large city. The population of a small village of 10,000 people may be changed very suddenly by the location of a new industry, as in wartime, or by a blight such as an unpredictable devastating flood, fire, or pestilence. Nevertheless, even in such small communities there is some evidence of the S shape in the population curve, which can be used to good advantage in planning. Indeed, even the local impulses may be viewed as forms or variants of economic opportunities, whether positive or negative.

The school planner becomes easily confused by an obvious oversimplification of his problem; namely, that in these times city people are moving to the country and urban schools are tending to become empty and suburban schools crowded; therefore — "write off the loses in one and double the capacity of the other." Superficially, it seems as simple as that. The fact is that the dispersion of city folk to the country is secondary in importance (although it is the more spectacular) to the certainty that both urban and suburban population curves are rounding off to flatten themselves against a natural ceiling. Thus, the burden of this paper is to suggest a simple adaptation of Professor Velz's graphic forecasting method to school districts with an average daily attendance as small, perhaps, as 2000.

TABLE 1. POPULATION DATA AND FORECASTS FOR A SMALL COMMUNITY BY THE VELZ PROCEDURE

Year	Continental United States		New York State		New York City[a]		Long Island		County of Queens[b]		County of Nassau[c]		Town of North Hempstead	
	Thousands	Percentage Saturation	Thousands	Percentage Saturation	Thousands	Percentage Saturation	Thousands	Percentage Saturation	Thousands	Percentage Saturation	Thousands	Percentage Saturation	Thousands	Percentage Saturation
(a) Observed Data														
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1790	3,929	2.3	340	2.1	231	1.4	37	0.2	17	0.6	....	....	....	....
1800	5,308	3.1	589	3.7	291	1.8	42	0.6	17	0.6	....	....	....	....
1810	7,240	4.3	959	6.0	365	2.2	49	0.7	19	0.7	....	....	....	....
1820	9,638	5.7	1,373	8.6	425	2.6	57	0.9	22	0.8	....	....	....	....
1830	12,886	7.6	1,919	12.0	551	3.3	70	1.1	22	0.8	....	....	....	....
1840	17,069	10.2	2,429	15.2	756	4.6	110	1.7	30	1.1	....	....	....	....
1850	23,192	13.6	3,097	19.4	1,163	5.1	213	3.3	37	1.3	....	....	....	....
1860	31,443	18.5	3,881	24.3	1,835	11.1	380	5.8	57	2.0	....	....	....	....
1870	38,558	22.7	4,382	27.5	2,375	14.4	541	8.3	74	2.6	....	....	....	....
1880	50,156	29.4	5,083	31.8	3,026	18.3	744	11.5	91	3.2	....	....	....	....
1890	62,948	37.1	6,003	37.5	3,966	24.1	1,029	15.8	128	4.6	51	6.4	8	5.4
1900	75,995	44.7	7,268	45.5	5,385	32.7	1,453	22.4	208	7.4	55	6.9	12	8.0
1910	91,972	54.1	9,114	57.0	7,467	45.3	2,098	32.3	368	13.1	84	10.5	18	11.9
1920	105,711	62.5	10,385	64.9	8,979	54.4	2,724	42.0	595	21.2	126	15.7	26	17.6
1930	122,775	72.1	12,588	78.7	11,458	69.5	4,104	63.1	1,382	49.4	303	37.8	62	41.5
1940	131,410	77.2	13,479	84.2	12,308	74.5	4,600	70.8	1,704	60.8	407	50.9	83	55.6
(b) Forecast														
1950	142,000	83.5	14,300	89.5	13,800	84.0	5,360	82.5	2,255	80.5	560	70.0	112	74.9
1960	149,000	87.5	14,900	93.2	14,820	90.0	5,780	89.0	2,530	90.5	672	83.9	129	86.0
1970	156,000	91.6	15,200	95.2	15,350	93.2	6,080	93.6	2,675	95.6	736	91.9	140	93.2
1980	160,000	94.0	15,550	97.1	15,800	95.8	6,240	96.1	2,745	98.0	785	98.0	145	96.4
1990	162,800	95.7	15,700	98.2	16,050	97.3	6,360	98.0	2,775	99.0	793	99.0	147	98.5
2000	165,000	97.0	15,800	98.9	16,200	98.4	6,420	98.9	....	....	....	....	149	99.3
2010	167,000	98.1	.....	....	16,310	99.0	....	....	....	....	....	....	....	....
2020	168,000	99.0	.....	....	.....	....	....	....	....	....	....	....	....	....
Infinity	170,000	100.0	16,000	100.0	16,500	100.0	6,500	100.0	2,800	100.0	800	100.0	150	100.0

[a]The larger metropolitan area, including all of Fairfield County in Connecticut; Dutchess, Putnam, Orange, and Rockland counties in New York; and Somerset, Middlesex, and Monmouth counties with parts of Bergen and Passaic counties in New Jersey. [b]Including the population of Nassau County which was organized from part of Queens County in 1899; [c]Formed from part of Queens County in 1899.

*Editor of Proceedings, American Society of Civil Engineers.

[1]*Civil Engineering*, October, 1940, p. 619.

A Simplified Measuring Tool

The basic principles of Professor Velz's procedure can be outlined briefly by applying it to a forecasting test of a comfortably all-inclusive area, such as the whole of Metropolitan New York City; that is, New York City and its environs. This includes the population of the five boroughs as a central core, surrounded by a suburban (bedroom) ring of about six counties, and beyond that a rural ring of about nine counties in three different states.[2] The basic census data are shown in Column 5, Table 1, with a forecast beyond 1940.

In Table 2, the values in Column 2 are taken from Column 5 of Table 1 as the first step in constructing a graph for estimating the maximum largest population. Increases (Column 3) and percentage increases (Column 4) are computed over the current year for each 10-year interval of time, as shown. With the passing of time, as the total population grows ever larger, the percentage increase per 10-year interval inevitably approaches zero — that is, a year in which there is no further growth. By plotting population as vertical values and percentage increase as horizontal values (see Fig. 1) this general trend toward a saturation point, or zero percentage of increase, is apparent. The straight line representing an average of all these points is marked "Trend 1" in Figure 1.

Incidentally, the actual variations from the straight line offer some interesting food for thought when historic events are shown at corresponding dates. Thus, the impact of secondary "economic opportunities" such as the Coolidge boom decade, the depression decade, etc., stand out impressively in Figure 1. If projected to zero rate of increase, the straight line (Trend 1) intersects the zero ordinate at a population of about 19,600,000. This value, accepted as a first trial, is assumed to be the highest possible population. If we knew when the saturation point would occur, Column 2, Table 2, could be plotted against years as a complete S curve, with its upper (100 per cent point) at 19,600,000. The population curve to 1940 can be plotted in terms of percentages of the total similar to the plotting of the circled points in Figure 2a. In this same figure, Curve 1 is a standard S curve proposed by Professor Velz as a device for rating population data. Assume the horizontal line through the center of this curve to be fixed. Then pull the top upward and the bottom downward until the S has straightened. The square grids of the Cartesian graph paper have then assumed the curious, complicated spacing shown in Figure 2b; but every perfect population curve plotted in terms of percentages on this paper becomes a straight line, and deviations from the straight line indicate the degree to which the data are imperfect.

On this idealized special graph paper the standard population curve appears as a straight line that slopes upward and horizontally at an equal rate; that is, it has a slope of 1 upward to 1 horizontal. Actual population data can be compared to this straight line because they will appear as straight lines either flatter or steeper than the standard. If the rate of population growth is steeper than the standard the straight-line curve will be steeper — say 2 upward to 1 horizontal — and the population may be said to have a "growth coefficient" of 2. If this growth coefficient is less than the standard (say 0.8) the population growth is slower than the standard guide. In a general way the same trends can be discerned in Figure 1.

When the percentages for New York City and its environs, from Table 2, Column 5, were originally plotted (not shown in Fig. 2b), it was possible to identify three definite straight lines, with breaks at the year 1830 and again at 1890 or 1900. This indicated that Trial 1 in Figure 1 should be redrawn, omit-

TABLE 2. COMPUTATION OF HIGHEST PREDICTABLE POPULATION, LARGER NEW YORK CITY

	Population (thousands)[a]	Increase	Percentage Increase	Percentage of Total Saturation Trial 1[b]	Final estimate[c]
(1)	(2)	(3)	(4)	(5)	(6)
(a) Observed Data					
1790	231	....	....	1.2	1.4
1800	291	60	20.6	1.5	1.8
1810	365	74	20.3	1.9	2.2
1820	425	60	14.1	2.2	2.6
1830	551	126	22.9	2.8	3.3
1840	757	206	27.2	3.9	4.6
1850	1,163	406	34.8	5.9	5.1
1860	1,835	672	36.6	9.4	11.1
1870	2,375	540	22.7	12.1	14.4
1880	3,026	651	21.5	15.4	18.3
1890	3,966	940	23.7	20.4	24.1
1900	5,385	1,419	26.3	27.5	32.7
1910	7,467	2,082	27.9	38.0	45.3
1920	8,979	1,512	16.8	45.9	54.4
1930	11,458	2,479	21.6	58.5	69.5
1940	12,308	850	6.9	62.8	74.5
(b) Forecast					
1950	13,850[c]	....	....	....	84.0
1960	14,820[c]	....	....	....	90.0
1970	15,350[c]	....	....	....	93.2
1980	15,800[c]	....	....	....	95.8
1990	16,050[c]	....	....	....	97.3
2000	16,220[c]	....	....	....	98.4
2010	16,310[c]	....	....	....	99.0
Infinity	16,500[c]	....	....	100.0	100.0
Trial 1[b]	19,600	....	....	....	....
Final estimate[c]	16,500	....	....	....	....

[a]From Column 5, Table 1. [b]From Figure 1, estimating 100% = 19,600,000 in Column 2. [c]From Figure 1, corrected estimate, 100% = 16,500,000. The "observed" percentages in Column 6 are plotted in Figure 2(b) and a straight line is projected through them to the top of the graph paper. The forecast percentages are then read directly from the graph. These percentages of 16,500,000 are finally converted back to forecast populations in Table 2(b).

[2]*Bulletin 55*, "Regional Plan of New York and Its Environs."

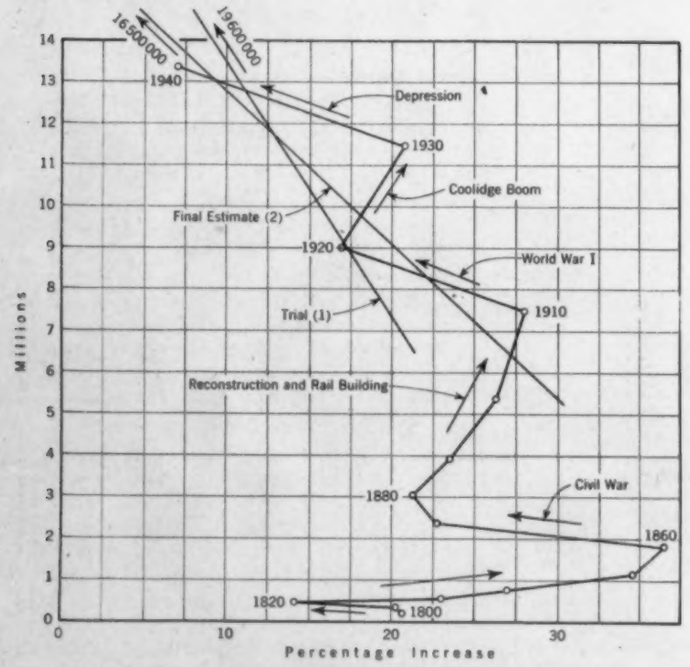


Fig. 1. Estimate of population saturation.

TABLE 3. POPULATION DATA AND FORECASTS, UNION FREE SCHOOL DISTRICT NUMBER SIX

	Community Population		Children, 0 to 18 Years		Public School to Include Grade 12	
Year	No.	Percentage Saturation	No.	Percentage Saturation	No.	Percentage Saturation
(a) Observed Data						
1921	.....	....	....	....	417	16.7
1922	965	4.8	....	....	548	21.9
1923	.....	....	....	....	575	23.0
1924	.....	....	....	....	624	25.0
1925	.....	....	....	....	655	26.2
1926	.....	....	....	....	550	22.0
1927	.....	....	....	....	600	24.0
1928	.....	....	1,190	23.8	634	25.3
1929	3,500	16.7	1,450	28.2	729	29.1
1930	.....	....	1,582	29.9	892	29.2
1931	.....	....	1,750	31.6	996	35.6
1932	.....	....	1,776	35.2	1,046	39.8
1933	.....	....	1,919	38.4	1,168	41.9
1934	.....	....	1,929	38.6	1,235	46.7
1935	.....	....	2,099	42.0	1,228	49.5
1936	.....	....	2,324	46.5	1,245	49.1
1937	7,122	34.0	2,461	49.2	1,429	50.0
1938	8,256	39.2	2,629	51.5	1,479	57.1
1939	9,105	43.4	3,018	60.3	1,539	59.0
1940	9,892	47.1	3,070	61.4	1,748	61.5
1941	11,215	53.5	3,279	65.6	1,911	70.0
1942	12,235	58.4	3,496	69.8	2,048	76.5
1943	12,948	61.6	3,602	72.1	2,104	82.0
1944	12,895	61.5	....	....	2,094	84.2
(b) Forecast						
1950	17,100	81.5	4,500	90.0	2,360	94.1
1960	20,000	95.2	4,900	98.0	2,480	99.0
1970	20,800	....	4,950	99.0	....	....
Infinity	21,000	100.0	5,000	100.0	2,500	100.0

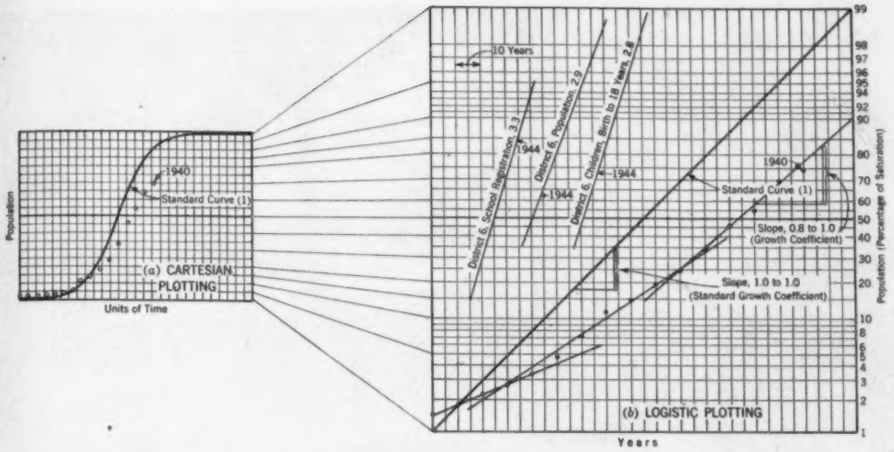


Fig. 2. Typical example of population forecasting by use of graphs.

ting the years prior to 1900. The new trend line in Fig. 1 is marked "final estimate (2)." It intersects the line of zero increase at a new saturation with a population value of 16,500,000. By simple comparison (correlation) the new value is found to be consistent with the ceiling computed for New York State, the next largest colony (see Column 3, Table 1). Considering this new ceiling for New York (City and environs) as 100 per cent, a final estimate (Column 6, Table 2) is made in terms of percentages, and these are shown plotted in Figure 2b. (See small circles.) Extension of the last section of straight line on this curve to the ceiling indicates that New York and its environs would reach a stable population of 16,500,000 in the year 2010. The percentages of saturation for intervening years can be read from the projected straight line and converted back to population figures as shown in Table 2.

The year 2010 indicates a span of 70 years before New York (and environs) needs to worry about a stabilized population, but reference to Column 6, Table 1, shows that this region is now about "75 per cent old" and will be "93 per cent old" in 26 years. The growth coefficient is 0.8 compared with the standard 1.0, which means that the region is "growing older" slower (80 per cent slower, in a sense) than normal.

The coefficient of growth strength (relative steepness of the straight line in Fig. 2b) is ever important in this task. If a consistent coefficient can be determined, it can be used over the entire growth history for even small groups of data. As a matter of incidental interest, the growth coefficients for the groups in Table 1, 2, and 3 are estimated by the writer approximately as follows:

Continental United States	0.7
New York State	0.9
Larger New York City	0.8
Long Island	1.1
Queens County (including Nassau County)	1.6
Nassau County only	1.6
Town of North Hempstead	1.5
School District Number 6:	
Entire population	2.9
0 to 18 years	2.8
Public school registration	3.3

Several of these rates are shown by the relative steepness of straight lines in Figure 2(b). The percentage of total saturation is indicated for one year (say 1940); and this is sufficient to reconstruct both the past and future population values.

The Future of a Suburban School District

So much for a self-contained area. How about a selected part of that area — the school-age population of a relatively small school district? It may have no industries, relatively slight local business activity, and a predominance of commuter characteristics. Superficially, future population growth seems to depend almost entirely on vacant land available for expansion. The writer believes that, if the growth pressure is great enough, land scarcity will not be a determining factor since, in that case multistoried apartment dwellings must ultimately appear and the convenient "available-land" ceiling is no ceiling at all. On the other hand, the availability of vacant land is no guarantee that the growth pressure is great enough to fill it. But, even if the maximum future population (saturation) could be computed as the number of people that would fill the land area completely, the rate at which filling will progress must be found if the planner is to make use of it.

The proposed approach is illustrated by the sequence of forecasts in Table 1, following the forecast for New York and environs, in Columns 7 to 14, and from there through Tables 2 and 3. The planner projects his data cautiously from the data for New York and environs to the population of all Long Island, observing the relative growth coefficients (the comparative slants of the straight lines in Fig. 2b) and making several comparisons and tests, such as that of Figure 1, to arrive at a reasonable saturation value. He then studies the population characteristics of the counties of Queens and Nassau together in relation to those of Long Island. Since Nassau County was once part of Queens County, its growth characteristics are examined in relation to the larger Queens County (including Nassau) — and so on, between successively smaller comparable communities as a person feeling his way in darkness will only venture one foot forward after he is confident that his other foot is on solid ground.

Significance of the Results

All the larger areas are growing slower than the standard rate, whereas all Long Island seems to be growing old faster. So that, although Nassau County and, within it, the Town of North Hempstead seem to be destined to double their population as of 1940, they are destined nevertheless to attain their full growth about the same time as the remainder of the United States.

In Table 3, the forecast is boldly made and brazenly supported that the school district will never need to supply facilities for more than 2500 pupils. For any local organization to accept the numbers as final and "official," of course, would be to misinterpret the purpose and scope of the paper, which is to demonstrate a single, simple tool of analysis in terms of a more or less hypothetical example. This tool is of fundamental importance, but it cannot be learned once, and applied thereafter "by turning a crank." Before the planner is ready to stake his reputation on a given project, on such preliminary studies as those presented here, he will study all possible data for corroborative testimony: commuter statistics, automobile registrations, telephone installations, local newspaper subscriptions, and many other important data. The complete study is beyond the scope of the present paper. Whatever the local influences are, however, the graphic principles of the Velz procedure will be found essential as a framework and a guide to good judgment.

Considered Judgment Needed for Good Results

In order to present the complete picture of the logistic, S growth, the forecasts have been projected as far ahead as the very end of the twentieth century. Ordinarily this is too far ahead for practical use by even the most precise, imaginable, mathematical methods. Despite these reservations, responsible administrators will recognize that the problem of the planner, dealer in futures, is very similar to that of the skipper of an ocean-going ship. When he leaves a home port, he sets an initial course on the basis of what he knows about latitude and longitude. Thereafter, he "shoots the sun" at regular intervals and corrects his course as needed. He knows that his sextant has limits of accuracy, that the deck of his ship rocks while he is making observations, and that cross currents of wind and water can affect the neat framework of his calculations.

Nevertheless, it is the captain, and the planner, with the proper respect for the tools of his trade who makes the port of call. In a period when so much emphasis is given to postwar planning, the procedure suggested in this paper is a "sextant," and will be useful to the extent that the planner has made himself familiar with the laws of "navigation."

BAY CITY HOLDS SUCCESSFUL SCHOOL ELECTION

Benjamin Klager[1]

The problem of raising funds for new school construction is a difficult one. The experience gained in a campaign may provide some helpful ideas for other communities facing similar problems.

On May 8, 1944, the voters and school patrons of Bay City, Mich., were asked to approve a school-building proposal which would insure a new school plant.

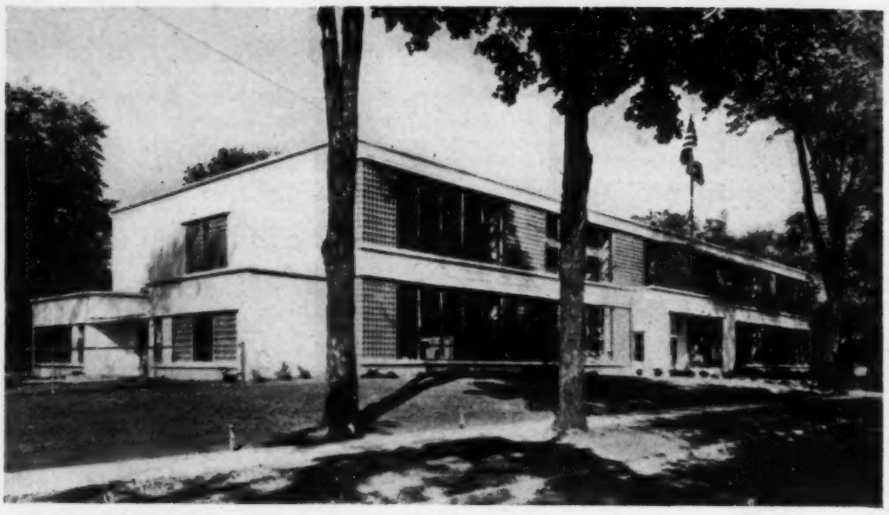
In seeking needed additions to the school plant, the schools were faced with serious difficulties. An amendment to the Michigan state constitution had resulted in active competition among various taxing units for a share in a limited total tax which proved inadequate for the support of all local units of government. In addition, it became impossible to secure the necessary two-thirds vote in favor of any proposal to raise the 15-mill limitation.

In November, 1943, the loss of the Eastern Junior High School by fire brought the matter of a new building program actively before the citizens of Bay City and caused the development of a program to raise the necessary funds.

In arranging the program, the superintendent of schools and the board set up as their guide three important essentials: (1) to obtain the confidence of the public in the integrity of the board; (2) to plan a community program in which the general public would form a part; (3) to base the campaign upon factual information and to conduct the publicity campaign in an open manner.

Based upon a school-plant survey, the superintendent and the board planned and outlined their building program. The board used a two-year-old questionnaire to determine the thinking of the public. Before presenting the final plans to the public, the board submitted them to a representative group of thirty citizens, who were invited to meet with the board and to review its thinking and conclusions on the subject. Three meetings with the group were held during which every phase of the program was weighed and re-evaluated. The program, as arranged, was found sound and reasonable and the participating group pledged its entire support to the project.

[1]Superintendent of Schools, Bay City, Mich.



The Farragut School, erected in 1941, is the starting point for the designs of the new schools to be erected by the Bay City board of education.

The next step was the selecting of a steering committee to take the full responsibility for projecting and conducting the campaign. This committee included the editor of the daily newspaper, the radio-station manager, the commerce secretary, two board members, the superintendent, and four other community leaders. This committee became a citizens' committee and was responsible for enlarging the group to more than 2000 individuals. It held weekly meetings, planned the successive steps in the campaign, and each person became responsible for some particular phase of the program.

Following the meeting of the general committee, a number of ward meetings were held, with the ward chairmen in charge of the several groups.

Registration of school electors was effected in four days in meetings held in the elementary schools. Names of parents with children were checked with registration files and all persons were urged to register. Information bulletins were sent to the homes by the children. Some schools conducted contests to secure 100 per cent registration. In all, 3000 new registrations were obtained.

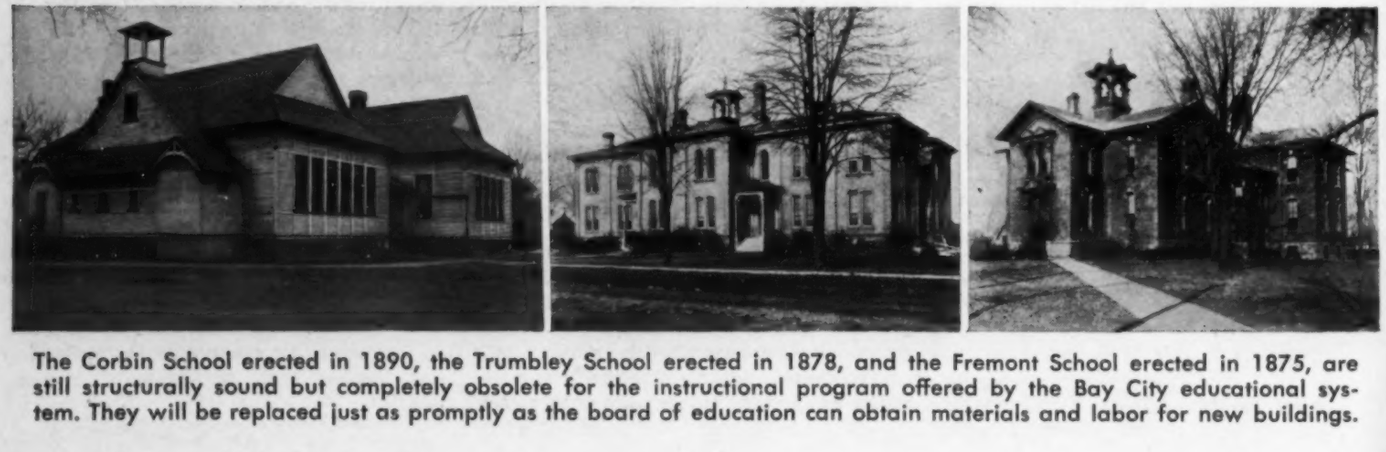
The publicity campaign was conducted continuously during the six weeks of the actual campaign and 48 stories were printed in the local press. Forty public meetings were held and talks were given by citizens, board members, and officials which were publicized by the press and radio. Thirty-two clubs and organizations in endorsing the program prepared copy for new stories from day to day. Under the steering committee, all publicity material was kept on a factual basis with strong emphasis on the educational advantages to be achieved, and questions and answers were prepared and distributed to speakers and other leaders.

Display advertising was limited to the period immediately preceding the registration and election days. The cost of advertising was cared for through contributions of citizens and a total of $1,500 was raised. The climax was a full-page advertisement listing more than 1000 individuals and 30 organizations who had endorsed the program.

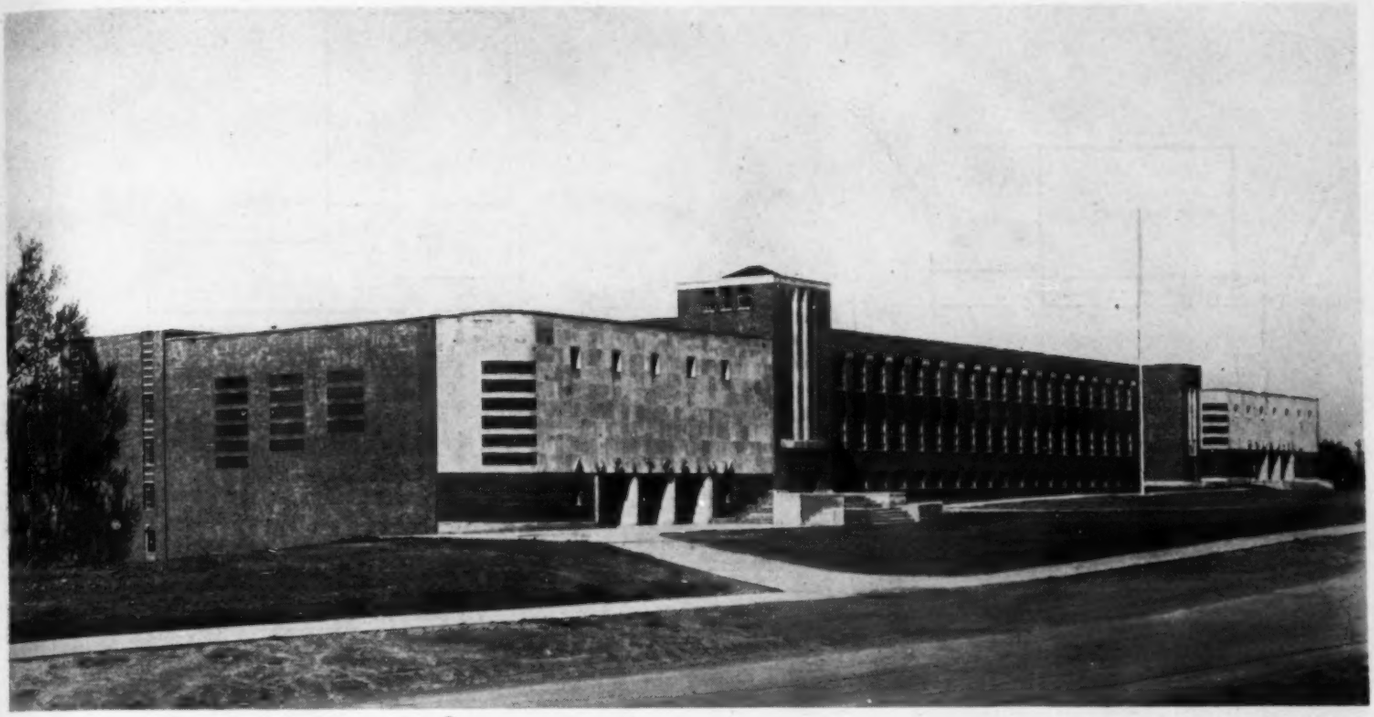
Printed material distributed to the public was limited to three items: (1) solving school-building problems of the city, (2) what of the future, (3) the school program, a last-minute reminder on election day for parents to vote was sent home with the children. Numerous bulletins of information were prepared and issued by the steering committee to the group chairmen and ward speakers.

The effectiveness of the campaign was shown by the results of the election, in which

(Concluded on page 81)



The Corbin School erected in 1890, the Trumbley School erected in 1878, and the Fremont School erected in 1875, are still structurally sound but completely obsolete for the instructional program offered by the Bay City educational system. They will be replaced just as promptly as the board of education can obtain materials and labor for new buildings.



General Exterior, High School, Fairfield, Iowa. — Keffer and Jones, Architects, Des Moines, Iowa.

A Genuinely Useful Community School

W. G. Pence [1]

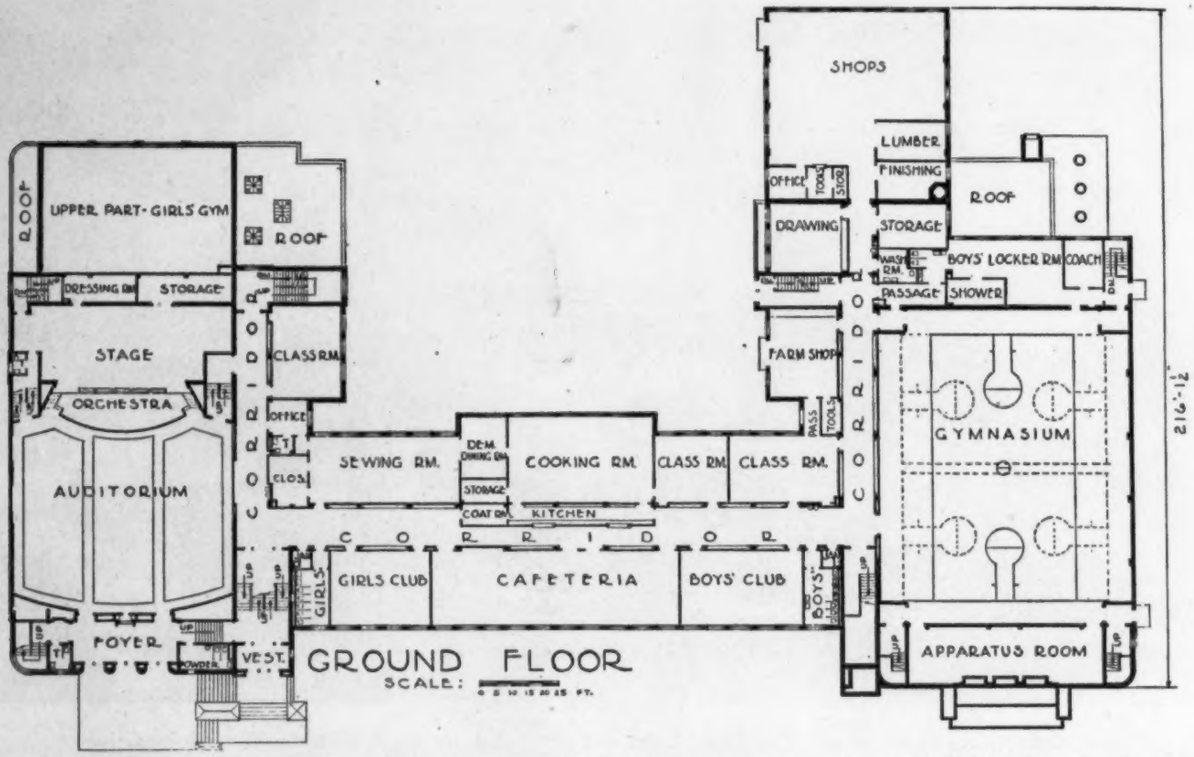
The Fairfield High School with all equipment except student records was completely destroyed by fire April 22, 1938. This building, constructed to house 450 pupils, was accommodating about 600. It was located on a half block site. Fifty thousand dollars in bonds had been voted to construct an addition with WPA assistance. The architects, Keffer and Jones of Des Moines, who had been employed for this addition, were commissioned to prepare plans for a new building.

In planning for the building, about forty schools were visited by the members of the board of education and school officials. Professor E. T. Peterson, acting dean of the College of Education, the University of Iowa, was selected as educational consultant and was extremely helpful in the selection of a site and in determining the general building policy. A progressive, farsighted, fearless board of education deserves most of the credit for the results obtained.

The building is constructed of full-color range, buff face brick with Bedford stone facing and trim. In the modern design a moderate use is made of glass block for lighting the stair wells and corridors. Reinforced concrete floors and frame are used, except over the gymnasium and auditorium which are structural steel. The roof decks are Vermiculite concrete over one-inch fiber board.

[1]Superintendent of the Fairfield Independent School District, Fairfield, Iowa.

The corridors are without obstructions of any kind to facilitate rapid travel between classes. Glass bricks provide borrowed light from the classrooms making the use of artificial illumination necessary only on dark days.

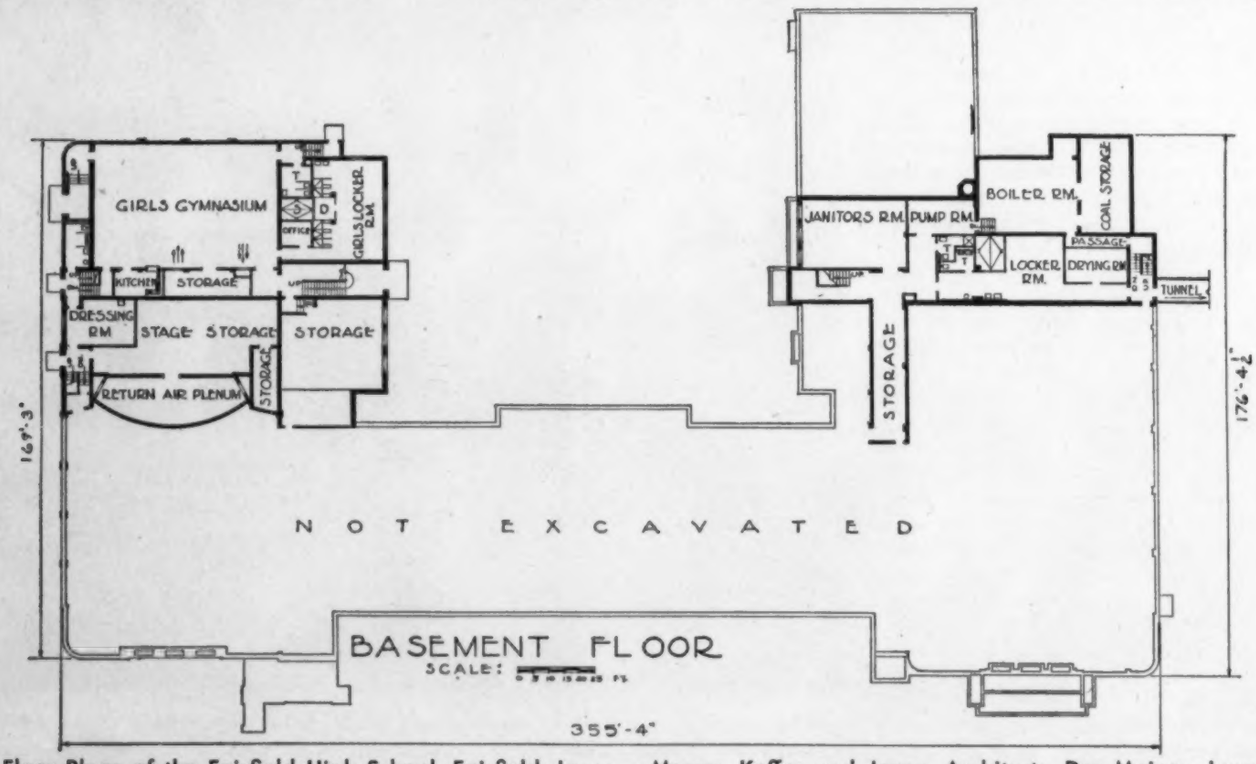


All interior wall surfaces subject to soiling are finished with buff salt-glazed tile. The floors in the corridors and service unit are terrazzo, and in the classrooms and offices, precast mastic tile are used. All ceilings throughout are acoustically treated, with especial emphasis on quieting corridors and balancing the acoustics in the auditorium. All doors, door frames, window frames, and window sashes are steel. Interior doors are finished in baked enamel.

The classroom units are window ventilated and have automatic temperature control. The larger units have individual mechanical ventilation and heat units. All heating units are regulated by automatic dual temperature controls.

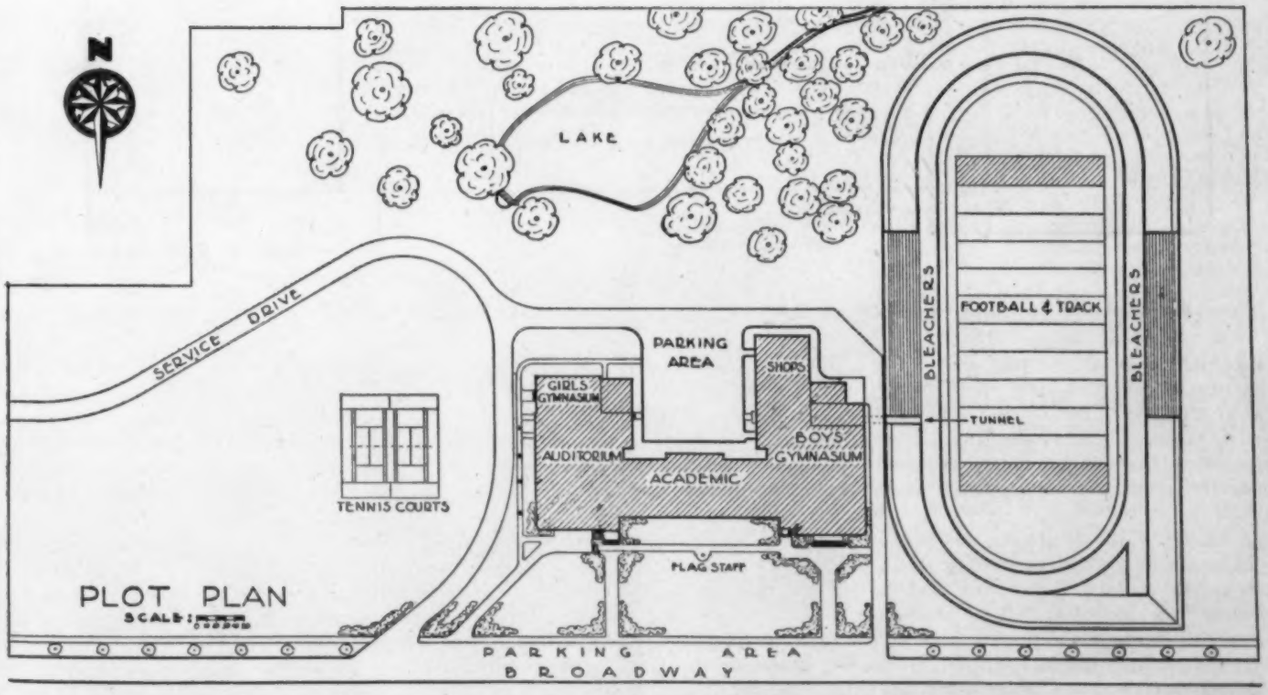
Low pressure vapor heat is furnished by two boilers equipped with return pumps. The boilers are fired by plunger-type stokers designed to burn low priced local coal. Ash is removed by a Louden conveyor.

The new Fairfield High School is located on a 23 acre site four blocks from the business district of the community. This site was available because it had been considered too rough for other use and because there was

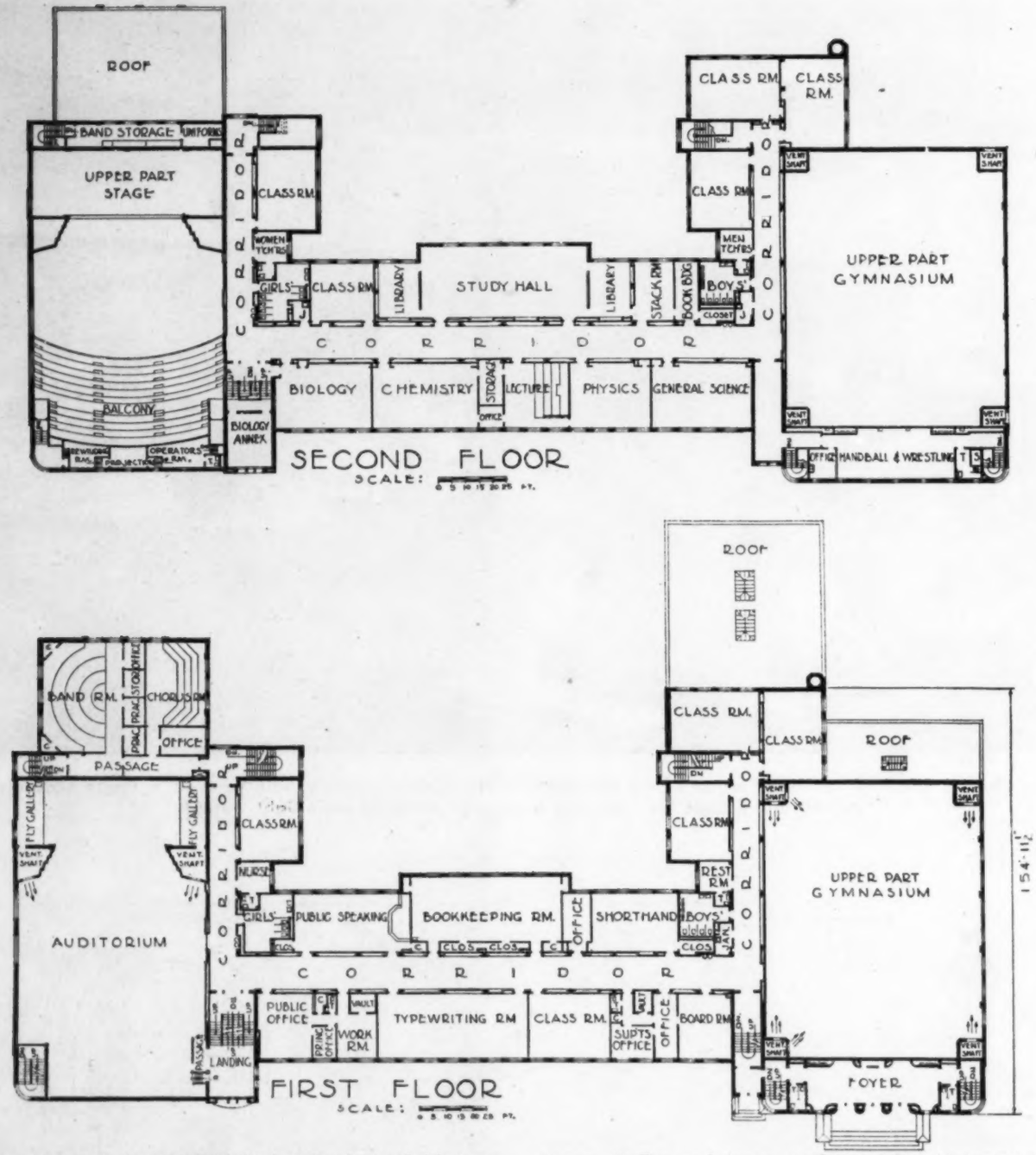


Floor Plans of the Fairfield High School, Fairfield, Iowa. — Messrs. Keffer and Jones, Architects, Des Moines, Iowa.

The library, which is the nerve center of the academic work, is harmoniously finished with a sound-absorbing ceiling and rubber tile floor. The bookcases are finished in light walnut.



The building was located to take advantage of the peculiarities of the rough, uneven site.



Floor Plans of the Fairfield High School, Fairfield, Iowa. — Messrs. Keffer and Jones, Architects, Des Moines, Iowa.

a sewage outlet at one corner only. The grounds extend approximately four blocks east and west and three blocks north and south. The property is accessible from streets on three sides. The building faces the paved street to the south and is one block from the highway.

About 150,000 yards of grading was necessary. This included the construction of a stadium in the widened ravine just east of the building. The 3000 seats of the stadium are on the slopes facing the playing field and were constructed from material salvaged from the old high school. There is an eight-lane track around the football field. The grading and construction of the stadium was a $50,000 WPA project not shown in the cost statement.

A tunnel leads from the track level under the road and into the basement dressing rooms as shown in the plat plan. Two play fields and four tennis courts are located west of the building. One field is for use by boys and one for girls. The two-acre lake north of the building is stocked with fish by the State Conservation Commission and is used in winter for skating. There are ample parking spaces north of the building and east of the stadium.

The Fairfield High School is a functionally designed building. Each teacher and department was asked to submit plans and descriptions indicating the amount and arrangement of space and equipment needed for the best results. The architects made these drawings and statements the basis for their work.

Each unit of the building was evaluated in terms of its use to the community and to other departments of the school. The location of each department was influenced by the probable amount of use by the adults of the community.

In use, the building has amply justified the hopes of those who planned it. It has become truly a community center. The number of

GENERAL STATEMENT
OF RECEIPTS AND EXPENDITURES
OF BUILDING FUND

Receipts	
Insurance	$186,122.00
Bonds and premium	105,593.00
PWA grant	240,086.00
Salvage and other sources	4,446.00
Total	$536,247.00
Expenditures	
Site	$ 28,286.00
General construction	327,136.00
Plumbing, heating, and ventilating	62,288.00
Electrical	14,758.00
Equipment	71,766.00
Architectural and miscellaneous	32,013.00
Total	$536,247.00

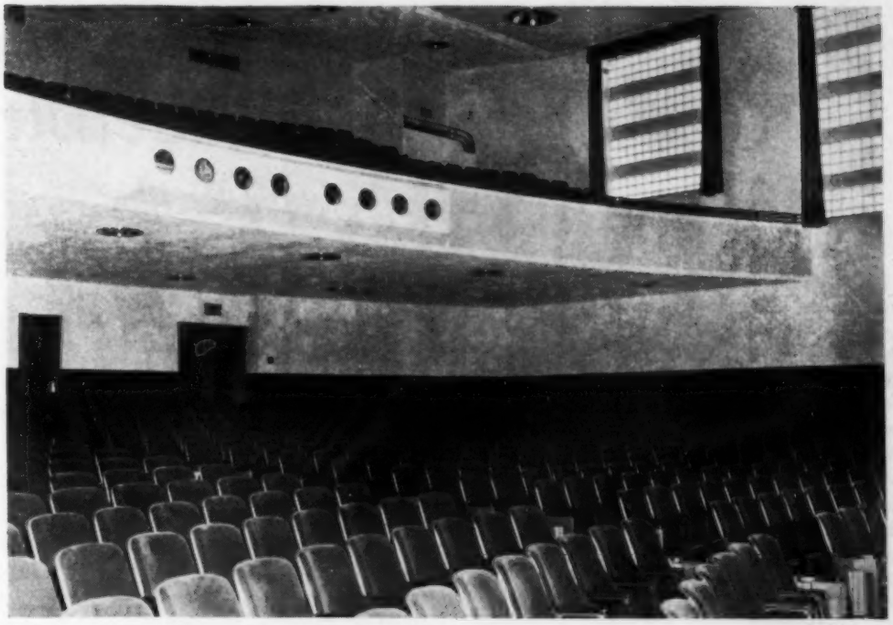
Measurements	*Width*	*Depth*
Building	355' 4"	215' 8"
Auditorium	70'	91' 6"
Stage	70'	25'
Library	28'	92'
Main corridor	12'	203' 6"
Gymnasium	80'	100'

Capacities: building, 750 pupils; auditorium, 1068; gymnasium, 1200; lunchroom, 200.

The cubage of the building is 1,700,000 cubic feet. The floor space is 92,000 square feet.

Classrooms, including gymnasium — ground floor, 10; first floor, 11; second floor, 10.

In addition: biology annex, board of education offices, high school office, Boy Scout room, Girl Scout room, lunchroom, library rooms, boiler rooms, store rooms, rest rooms, shower, wash rooms and locker.



The auditorium is fitted for motion picture projection and complete color lighting effects.

adults using the building to continue or supplement their education has annually equaled or exceeded the number of adolescent high school pupils enrolled. The planning and locations of the various rooms and units so as to serve two or more purposes or groups has greatly increased the general usefulness of the building.

Adult classes in blueprint reading, electric and acetylene welding, machine-shop practice, sheet metal, carpentry, radio, electricity, typing, shorthand, clothing, cooking, first aid, farm crops, feeding of farm animals, farm management, Spanish, and mathematics have been offered. An attempt is made to accommodate any group of ten or more desiring instruction.

The separate gymnasiums for boys and girls in different wings of the building are used continuously in a greatly expanded physical-education program.

The housekeeping suite provides opportunities for studying room arrangement and household management.

HIGH SCHOOL PROVIDES WEEK-END ACCOMMODATIONS

With tens of thousands of servicemen from near-by Army camps and Navy stations spending week ends in Los Angeles, a situation had developed in which hundreds of uniformed personnel were spending their nights on park benches, in police stations, and in all-night movies. That was before Hollywood high school faculty and students tackled the problem.

Now, under leadership of Louis F. Foley, principal, the high school's two gymnasiums are converted into barracks every week end. An average of 900 servicemen now "climb in the sack" there every week. Nor do they leave hungry next morning. A breakfast of an orange, cereal, fried eggs, and potatoes, buttered toast and jam, and coffee is furnished them. A service charge of 50 cents is made, barely covering actual costs. Faculty and students do most of the work. To date almost 40,000 men have been furnished with breakfast and somewhat more than that number have been given beds.

This extra activity has not hindered normal war efforts of the school. To the contrary Hollywood high led the 400 other Los Angeles schools in a paper drive; collected 1200 books for a ship library.

WORK-EXPERIENCE PROGRAM AT AUSTIN

During the school year 1943–44 a work-experience program was carried out in the high school at Austin, Minn. There was an increased demand for students to work part time at the Hormel Plant and in other places of business.

Student schedules were worked out to permit boys to spend at least a half day on the farm during the rush season. Frequent meetings were held with the USES and Hormel employment officials to discuss the hours of work to be expected of high school students. Under the system, each person employed was required to report to the co-ordinator before being taken on. The procedure gave the school an opportunity to check up on the general fitness of the student.

Preliminary Considerations for Gymnasium Planning and Construction

Arthur R. Winters[1]

Every school-board member, every superintendent, every principal, and every physical-education instructor is charged with the responsibility of maintaining the health and improving recreational life of the pupils committed to his supervision and teaching. The extent of this charge is moving rapidly to encompass the physical-activity program of the entire community. This means provision of facilities — gymnasiums, swimming pools, and playing fields — for the kindergarten upward. Some communities are fully equipped but many possess inadequate plants, while still others are totally lacking essential facilities for the promotion of a minimum program.

Any discussion of gymnasium construction must take into account the fact that such units are normally built as an integrated part of the enlarged or total educational plant. However, separate structures or independently constructed wings have been and will continue to be erected. Either as a part of the whole school plant or as an addition, the construction of a gymnasium demands and merits particular consideration. In providing suitable and adequate buildings for the administration of this vital area of our educational program all parties concerned should study the needs and interests of the groups to be served and plan their building program in accord with local social and economic conditions. Let us then examine some of the trends, some of the forces, some of the limitations which are likely to exert their impact upon building programs pertinent to health, physical education, and recreation. In them we may find suggestions applicable for future if not immediate action.

Community Uses of School Gymnasiums

One of the first trends which will affect gymnasium construction is the extended use being made of these facilities beyond the usual school hours. Dancing, roller skating, physical-conditioning classes, badminton clubs, volleyball and basketball teams representing the community are some of the activities in which recreational-minded and health-seeking citizens will engage and foster. The gymnasium, under competent leadership, may easily become a force for curbing juvenile delinquency.

Another factor which will condition the use-concept of the gymnasium and the subsequent construction of the same will be the type of physical-education program which will evolve in the postwar period. Examination of the present trend indicates that the content of the future program will be varied in scope but undoubtedly will be influenced by the emphasis on physical fitness now accorded in our programs. While the aim, the preparation of youth for service in the armed forces, will change, the basic objectives of physical education will remain, but will be subject to a different approach and emphasis. It is the considered opinion of many leaders in the field of physical education that we shall not return to a "free play" or purely recreational type of program, so prevalent in the prewar period, but will combine many aspects of the physical-conditioning, endurance-developing program, with games and recreational activities to form a complete group of well-balanced activities for the growth and development of youth.

War Influences on Gymnasium Use

Any program must be designed with consideration for such compelling forces as (1) the recreational needs of our returning servicemen, (2) the probable enactment of a compulsory-military-service bill, and (3) public reaction toward the large percentage of men rejected for military service because of physical disabilities. While not many youths who served in the war will return to high school, the recreational interests and needs of this large group of young men as members of the community should be anticipated. This may be termed recreational therapy. The impact of impending compulsory military training may re-emphasize the necessity of conditioning the boys so they may readily meet the demands of this type of training. This proposed legislation will be opposed by some educators who will contend that the same purpose will be served through an intensified physical-training program in the secondary schools. Their position is weakened, however, because our present physical-education facilities are not adequate to meet the requirements of such a counterproposal. The third force to be considered is the unfavorable reaction of the public to the number of young men rejected for service because of physical disabilities. While any program of physical training would not have prevented many of these defects, some could have been detected and remedied by sound school health services. The indictment of lack of physical stamina and endurance to resist fatigue cannot be disregarded. The future demands that this condition should not be repeated.

Consequently in the past two years we have heard the demand to increase the time allotment for physical education from the present practice of three hours or less per week to one hour daily. It follows that such a schedule will increase the load of any class period so as to tax present gymnasium facilities beyond their ordinary capacity.

State Program Requirements

Still another factor to take into account is the requirement of the respective state education departments. Many states have prepared curriculums which serve as a framework and guide for local programs. Any building program therefore should recognize and provide facilities which meet the scope of state planned programs.

Thus the planning of new construction or the remodeling of old structures calls for the recognition of several important factors, including the probable uses to be made of a given plant, changes in emphasis, the interests and needs of the citizenry with respect to physical education, and the requirements, both direct and indirect, imposed by state and federal governments. Furthermore, any immediate plans are likely to encounter obstacles, both real and imaginary.

The Construction Problem

At the moment we must acknowledge the limitations and restrictions, some more tangible than others, which preclude the fulfillment of immediate construction. The observance of required procedures and the shortage of essential materials are realistic factors to be considered. Projects requiring the expenditure of more than $10,000 have to be cleared in Washington. State planning commissions have to be consulted. Labor skilled in construction is a tight commodity, subject to control of the War Man-Power Commission. The acute lumber shortage heads restrictions on materials, while sheet steel is too scarce for locker construction; on the other hand, concrete, brick, insulating materials, and asphalt roofing are generally available.

Less tangible elements which act as a check on any school-building program are ever present. Lack of vision, lack of foresight, and lack of imagination on part of the school board stunt the educational growth of any community. Conservatism tends to dominate public enterprises as initiative lags, and the changing of school-board policies is a slow process. The approach to modern school-building construction must be functional, it must provide for flexibility and not be "obscured by monuments to the obsolete."

It is the thesis of the writer that inasmuch as the need for an enlarged physical-education program is continually rising, and as interest in recreation for healthful living is mounting, and although limitations do exist, it is in

(Concluded on page 81)

[1]Lafayette College, Easton, Pa.

Reinforced Brick Masonry—Its Value in School Building Construction

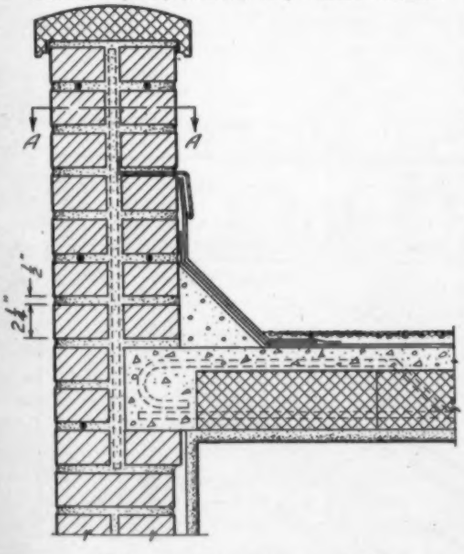
Harry C. Plummer[1] *and E. F. Wanner*[2]

Reinforced masonry is brick or tile construction in which steel reinforcing rods have been embedded and are so placed that they will resist tensile and bending stresses developed in the structure.

By combining reinforcing steel with the masonry, the properties of tensile and bending strength are greatly increased in the construction which permits its use for columns, beams, floors, and walls that may be subjected to lateral or eccentric forces. Such properties of brick and tile masonry as compressive strength, fire resistance, and durability are well known and have been demonstrated by both laboratory tests and the satisfactory performance of structures over periods of many years, and through the use of reinforced masonry the designer may utilize these properties and at the same time obtain a structure highly resistant to bending forces but similar in appearance to the conventional types of brick or tile construction.

The use of reinforcing steel in combination with masonry is not new. In fact, it was discovered over 130 years ago by the eminent British engineer, Marc Isambard Brunel. However, prior to about 1922 little effort was made to assemble a record of the performance of reinforced masonry structures or to establish design formulas and working stresses suitable for use in the design of structures.

[1]Director of Engineering and Research, Structural Clay Products Institute, Washington, D. C.
[2]Research Engineer, Structural Clay Products Institute.



R.B.M. PARAPET WALL

Figure 1

In 1922, Mr. A. Brebner, Under Secretary of the Government of India, Public Works Department, published a report in two volumes entitled "Notes on Reinforced Brickwork" in which he describes the brick masonry construction built by the local Indian government, and suggested formulas for the design of reinforced masonry.

Subsequent research sponsored by the Brick Manufacturers Association of America and continued by the Structural Clay Products Institute has contributed much valuable material to the literature on reinforced masonry and in 1932 the Reinforced Brick Masonry Research Board, predecessor of the present Structural Clay Products Research Board, was organized. This board is composed of masonry experts from engineering schools, outstanding consulting engineers, and other authorities on structural engineering. A comprehensive research program has been outlined, and the board has done effective work in directing and co-ordinating tests on masonry materials, and on both plain and reinforced masonry.

Modern Developments

During the past 10 years the use of reinforced brick masonry in this country has grown rapidly. Prior to the war, most of the larger structures were built in southern California where all buildings must be designed to resist earthquake forces; however, since Pearl Harbor and the emphasis that has been placed on designs to resist bomb blast, as well as the effort to conserve critical materials, including both steel and lumber, many large structures in the East have utilized reinforced masonry. Among the latter are the Naval Bomb Site Factory at Indianapolis, an air-conditioned windowless building, approximately 500 feet by 1000 feet in area with reinforced curtain walls approximately 50 feet high; and the Marine Corps' Camp Lejeune, New River, N. C., where over 6000 masonry lintels having spans of from 3 to 12 feet were constructed of reinforced masonry.

Reinforced brick masonry has also been used for the construction of rural housing in Mississippi where it was found that the cost of the reinforced brick homes was less than similar designs in frame.

During the past few years hundreds of thousands of square feet of precast reinforced tile floors have been installed in hospitals, housing projects, schools, and similar structures. The school building at Burlington, Iowa, constructed in 1937, designed by Holabird and Root, Chicago, Ill., with tile floors is typical of this construction.

Recent projects constructed in California include the FPHA Ramona Gardens Housing Project at Los Angeles, designed by Housing Architects, Affiliated, and constructed by Baruch Corporation, General Contractors, at a cost of $2,004,000. This project consists of 112 two-story buildings with 8-inch-thick reinforced walls for the first stories and 7-inch-thick reinforced walls for the second stories.

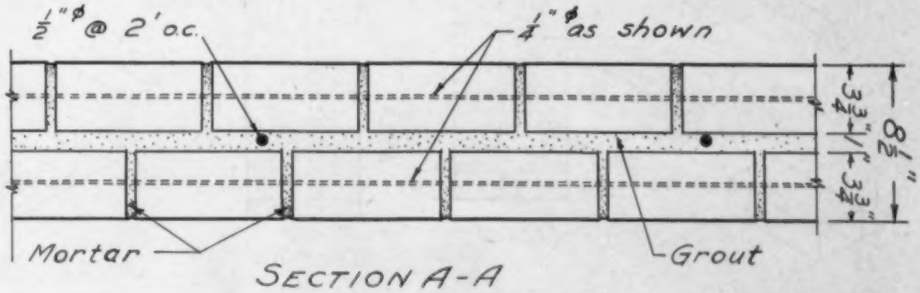
Reinforced masonry was also used for the construction of the Walt Disney Studios, Hollywood, Calif., which is wall bearing construction with 8-in-thick reinforced walls, 3 stories high.

Adaptability of Reinforced Construction

Reinforced masonry built of brick or solid masonry units is best adapted to the construction of beams, columns, and walls which may be subjected to high compressive as well as bending stresses. Reinforced hollow masonry is adaptable to the construction of floors or the walls of circular storage structures such as silos and bins in which the principal stresses are tensile.

For school-building construction, reinforced masonry is particularly well adapted for parapet walls, lintels, spandrel beams, columns, retaining walls, and floors.

Parapet walls are one of the most vulnerable elements of the average masonry structure. Being exposed to the weather on both sides, the masonry is subjected to frequent cycles of freezing and thawing and if, as often happens, the coping is not watertight, excessive amounts of water may enter the masonry. The situation is further aggravated due to the



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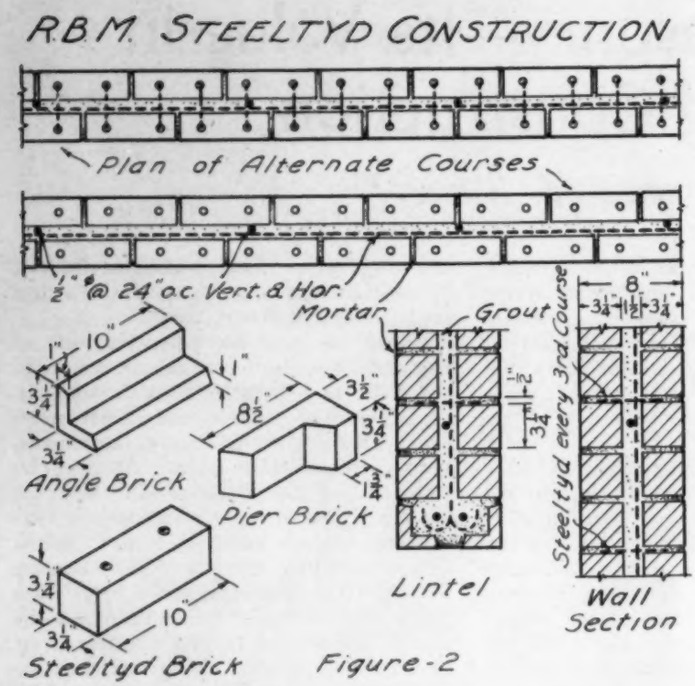


Figure-2

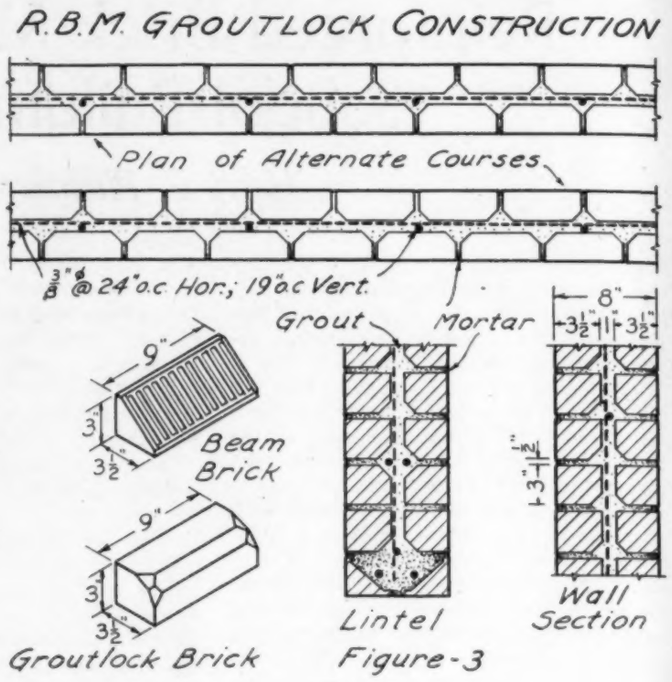


Figure-3

relative inaccessibility of the parapet and the resultant lack of maintenance in the form of pointing mortar joints, either in the coping or the parapet wall itself. As a result of severe exposure and lack of maintenance, copings and sometimes the brick from the parapet wall become loosened and may create a serious hazard during periods of high winds.

Reinforcing steel in the parapet walls, as illustrated in Figure 1, will resist movements of the masonry due to temperature changes or other slight movements of the structure and is cheap insurance against the danger of masonry falling on to the school ground.

Beams and columns which form a part of the exterior wall can be constructed of reinforced masonry which is bonded into and made a part of the exterior wall.

Lintels of reinforced brick or tile masonry are cheaper than most other types and also contribute to more watertight construction, since the lintel is built as an integral part of the wall. Experience indicates that the mortar joint in which a steel-angle lintel is placed or the joint between various types of precast lintels and the masonry is difficult to make watertight, and that leakage frequently occurs at this point. The reinforced masonry lintel requires no painting and can be relied upon to give satisfactory service for the life of the structure.

Frequently retaining walls are used in the development of school property and, where these walls are constructed of reinforced masonry, they can be built of materials which will harmonize with the school buildings and enhance the general appearance of the school grounds.

Reinforced brick masonry can also be used effectively in the construction of basement walls or the walls of boiler rooms; the latter of which may be from 15 to 20 feet

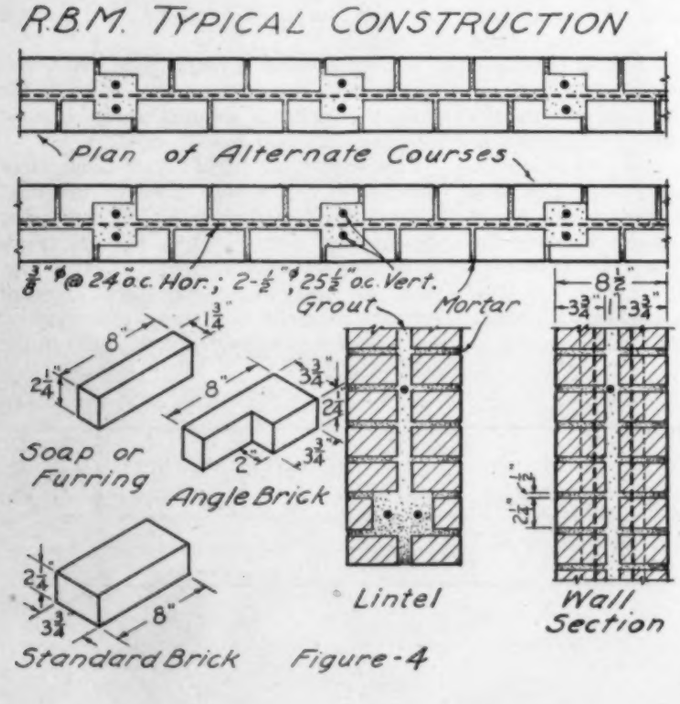
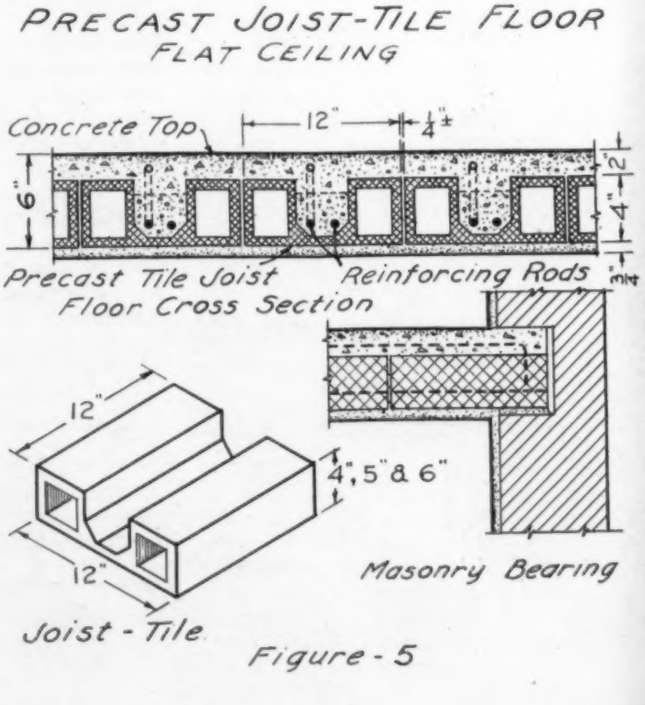


Figure-4



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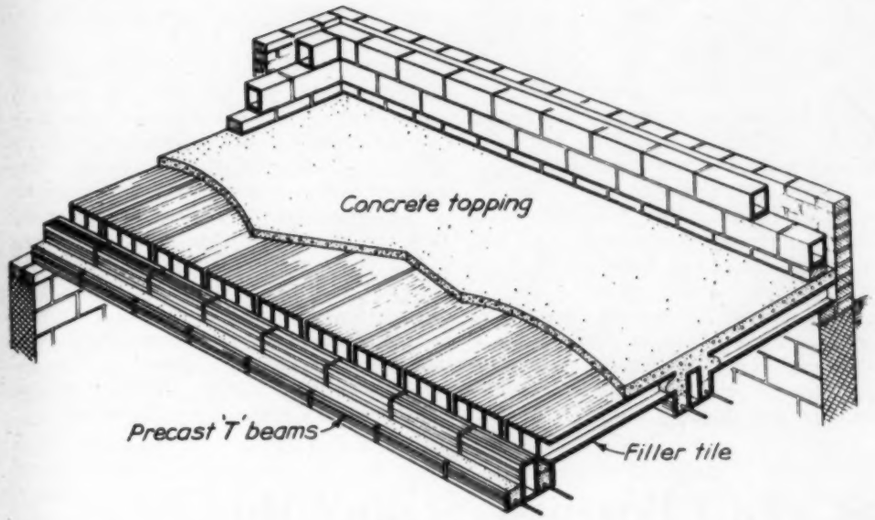


Figure 6

high. It is recommended that reinforcement (one ½-inch round rod in 8-inch-thick walls and two ½-inch round rods in 12-inch-thick walls) be placed around all openings to prevent cracking of the masonry which may result from unequal distribution of stress or uneven settlement of foundations.

Precast reinforced tile floors or combination tile and concrete joist floors have been used extensively in the construction of school buildings and are particularly well adapted for this purpose. In addition to their fire safety they have greater rigidity than many other types of floor, which not only gives lateral support to the building but reduces vibration due to movement of the occupants. Tile floors have also been found to be less subject to volume change during and after setting than solid concrete slabs.

Cost and Design Values

California contractors who are familiar with the construction of reinforced brick masonry consistently submit lower bids on walls of reinforced brick than of reinforced concrete. This difference is due primarily to the savings effected by the elimination of forms for vertical walls. The elimination of forms also conserves lumber and this factor may be expected to be an important consideration for postwar construction. Masonry contractors who have built reinforced masonry structures state that the difference in the cost between reinforced and unreinforced masonry is little more than the cost of the reinforcing steel used.

Reinforced masonry is designed to resist bending as well as compressive forces and it is essential that all joints in the masonry be completely filled. The method recommended for accomplishing this is to fill all interior joints with grout which is obtained by adding sufficient water to the mortar to give it a fluid consistency.

Since strength is usually of primary importance in reinforced masonry structures, only high strength mortars are recommended. The American Society for Testing Materials' specifications for mortar for reinforced brick masonry require a mixture of one part portland cement, one-quarter part hydrated lime, and three parts sand by volume. This mortar has been used extensively in the construction of reinforced brick masonry structures with very satisfactory results.

The strength of reinforced brick masonry is related to the strength of the mortar and the strength of the brick. Working stresses in flexure and bearing are best obtained by determining the compressive stress of prisms of masonry built of the same brick and mortar that will be used in the construction, and then basing these working stresses on the ultimate compressive strength of the masonry. Working stresses of from 25 per cent to 33 per cent of the ultimate strength are recommended. Working stresses for shear and bond are based on tests of full-size walls or beams.

The Uniform Building Code of the Pacific Coast Building Officials Conference, 1940 edition, includes the following working stresses for grouted masonry:

Shear (no web reinforcement)	**30 psi.**
Shear (with web reinforcement taking entire shear)	**60 psi.**
Bond (deformed horizontal bars)	**80 psi.**

A Typical Construction

Figures 2, 3, and 4 illustrate three types of reinforced brick masonry construction, all of which were developed in southern California. In 1937, the Los Angeles Vermont Avenue School was constructed of reinforced brick masonry using units of the type illustrated in Figure 4.

This school was designed by the architects of the Los Angeles board of education and Mr. Charles A. Fork, consulting structural engineer. In an article describing this project, Mr. Fork states:

"The new Vermont Avenue School in Los Angeles, Calif., is an outstanding example of what can be done to make brick construction safe in an area subject to earthquake shocks.

"The east and west wings of the schools are two stories high, connected in front with a one-story unit. The horizontal floor area is 38,700 square feet. Total cost of the building proper was approximately $180,000 or $4.62 per square foot of floor area. The school cost less than a similar job of concrete. This is significant in view of the fact that face brick were used to face the 13-inch exterior walls and interior corridors.

"Unusual features in this school are the use of shaped brick, and the grouting method for filling the interior joints.

"The walls are distinguished from the usual type of reinforced brick masonry in that definite channels are provided for a grout core around the reinforcement. This is accomplished by the use of three different brick shapes; the standard unit for general filler

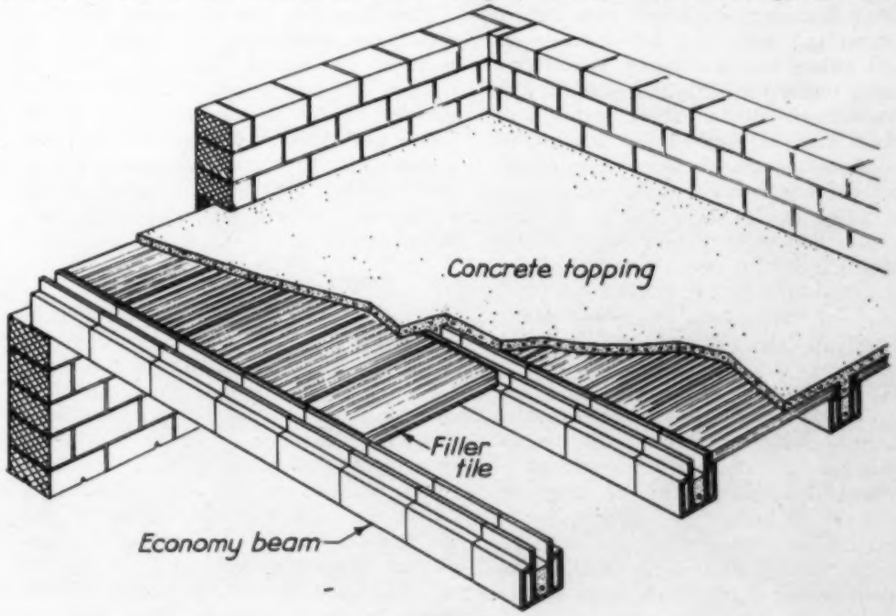


Figure 7

purposes, the ¾ unit to provide grout space for the vertical reinforcement, and the ½ or narrow unit to provide grout space for horizontal reinforcement.

"By the use of these units, it is possible to place the reinforcement nearer the faces of the wall, and thus increase its effective depth. Greater assurance of securing a good bond between steel and masonry is obtained by the large grouting space. A very notable feature of the ¾ unit is its extreme flexibility for accommodating any spacing of vertical reinforcing bars. The bar spacing need no longer be in multiples of brick dimensions. If the unit laid in the usual manner does not clear the bar, the unit is simply reversed, thereby moving the channel 4 inches forward. One unit provides a 4-inch channel, while two units placed adjacent to each other provide an 8-inch channel. In general, it is advisable to maintain a maximum bar spacing in order to provide sufficient working space for bricklaying. In this job, a spacing of 2 feet 2 inches was used, wherever possible, for the vertical bars, and a spacing of 2 feet 0 inches for the horizontal bars. When it became necessary to increase the steel area, either the size of the bar was made larger or the bars were grouped two in a channel."

Figures 5, 6, and 7 illustrate typical types of precast reinforced-tile-beam floor construction. The tile beams are usually precast at the building site, although some tile manufacturers precast them at their plants for projects where they can be economically delivered by truck.

Extensive tests have been made of precast tile floor beams, some of which are reported in Research Bulletin No. 236 of the Agricultural Experiment Station, Iowa State College.

Indications are that the use of reinforced masonry construction will coninue to expand in the postwar era and the Structural Clay Products Institute is now devoting a large part of its research program to an investigation and study of methods of design and construction of reinforced masonry. As this research is completed, the results will be made available to the construction industry through publications of the Institute, technical articles and reports of the research laboratories.

An Engineer's Ideas as to Postwar School-Building Heating and Ventilating

Samuel R. Lewis[1]

The pressure by government war agencies to conserve steel, copper, and nickel has brought out a long list of substitute materials for building construction and equipment. Ultimately many of these substitutes may be found to be better than the materials which had become conventional before the war. The failures, of course, will be dropped. To illustrate: it is probable that thin steel convectors, widely used in war plants in place of copper radiators and containing steam for heating air, will not endure, and that when the war plants eventually are wrecked, the buyers of many salvage items must be exceedingly "beware."

Great improvements have been made in building insulation which will save fuel, in partitions and walls with less thickness and weight without loss in efficiency, in corrosion-resisting tubing for fluids and gases, in electric conductors without rubber, and in wood products such as plywood and veneers. We have learned to manufacture and to employ cement-asbestos precast sheets or slabs to great advantage for ducts and air passages. Electronic devices for the control of heating, cooling, illumination, and power have developed amazingly. Plastic moldings and wall surfaces of great value in school-building construction have attracted most favorable attention.

Since few buildings which were under contract in 1941 have been finished, there has been no public school construction except for war-housing communities. Nearly all of the war-housing schools are of temporary type; many are heated by coal-burning warm air furnaces with pressure fans and nonmetallic ducts. No refrigeration for comfort-cooling purposes has been allowed since 1941.

[1]Consulting Engineer, Chicago, Ill.

War Pressures to Eliminate Ventilation

Where boilers were at all allowed in school buildings, pressure from the War Production Board has been toward the use of cast-iron sectional boilers. Fans and electric motors for ventilating purposes have been permitted in school buildings only under protest, and the volume of air allowed has been under constant attack by Washington zealots who expressed the belief that the designed new air volume per pupil per minute could be cut safely to as little as 5 cubic feet instead of the former minimum of 10 cubic feet, with air movement at a minimum of 30 cubic feet per minute.

They have suggested that odors which will accompany so small an air dilution can be removed by forcing the recirculated air through filters of activated carbon, such as were developed for wartime masks against poison gas. While such expedients may have a proper place in certain industrial processes, their universal application to school-building ventilation somehow does not awaken sympathetic endorsement.

Four Conventional Systems

Before 1942, a number of principal methods of heating and ventilating school-building classrooms were widely used.

1. The *all-blast system* transported the heat into the classroom on the air. There were no radiators in the rooms. The air was heated by direct-fired furnaces or by steam convectors exterior to the rooms. Ventilation volume was continuous, and temperature control was accomplished by varying the temperature of the air supply.

2. The *split system* included radiators placed in the classrooms. These radiators were essentially capable of warming the rooms without any help from the warmed air introduced for ventilation. The temperature in each room was controlled by opening or closing the steam supply valves to these radiators.

3. The *unit system* involved an electrically driven fan and convector in each room, usually supplemented by more or less auxiliary direct radiation. The fan and convector takes in outside air directly through the wall, and was arranged to recirculate all or part of the air in the room. Generally there was no outside air supply whatever unless the room was too warm. Sales promotion for unit ventilation recommended using the corridors as passages for spent air.

4. The *all-blast system* necessitated the operation of the supply fan in order to heat the rooms. This system must be especially well designed in order to insure equal distribution of the warm air. Recirculation of the air prior to occupancy was possible so as to reduce fuel cost. Generally the all-blast steam system with continuous ventilation was most economical of fuel and served well for elementary schools.

The split system was excellently well adapted to manual training buildings and high schools where many departments were operated overtime or in the evenings, and where it was desirable to maintain comfort for a few instructors or pupils without operating large central air supply and exhaust fans.

The locally placed unit-ventilator system, when applied regardless of consequences to very large elementary schools, had definite failings in that the maintenance of a large number of small electric motors and of outside air-intake dampers was high and that two thermostats per room were costly.

The manufacturers recommended the entire elimination of any independent, local

ventilating exhaust flues or ducts. They suggested an opening from each classroom into the corridor and openings from the top-story corridor ceiling into the attic. More conservative engineers condemned such a procedure because it invites smoke and heat, in case of fire, to fill the passages through which the pupils must escape. Since the thermostat on one of the walls cannot respond to variations in the temperature of the entering air, it is necessary to install an additional thermostat in the air stream leaving each ventilating machine, so that the entry of too cool air may be prevented.

Unit-ventilating machines in the ground level rooms of a school must have their outside air intakes so close to the ground as to pick up unnecessary dust and may even become clogged with snow. In one large school building the unit-ventilating machines were placed close to the ceiling in an attempt to overcome this objection, but the arrangement failed to maintain adequately warm floor temperature and satisfactorily cool head-level temperature. Despite these objections, the local ventilating unit is a cleverly designed and splendidly built device, especially useful for conservative school heating and ventilating services.

A Model Postwar System

If a board of education were to retain me to design the heating and ventilating of a new elementary school building, I think I should recommend some conservative innovations, but these would have basic characteristics with which I have had successful experience. The following high points would be included:

1. Steel boilers, two units, stoker equipped. Since most school buildings eventually require additions, I should provide space and chimney capacity for a third boiler. The efficiency of oil fuel used in locomotives for Diesel power so far surpasses the best that coal can do that no more oil should be burned in heating systems.

2. A central supply fan for classrooms, with a separate fan each for the auditorium and for the gymnasium. Exhaust fans for toilet rooms. Fans to be electrically driven.

3. An all-blast system; that is, the temperature of the air delivered to each classroom would be controlled by means of a double mixing damper responding to a thermostat in the respective room, the air delivery volume being continuous. There would be auxiliary-controlled radiant heat to compensate for downdrafts which come from large windows and exterior walls, but the radiant heat would not be designed to be sufficient in amount to permit occupancy without operating the supply fan. Offices and toilets rooms and auxiliary rooms would have independent heating.

4. Every classroom would have a vent flue leading to the attic, provided there with a no-back-draft damper and joining a trunk line duct in the attic. This duct would permit air recirculation back to the supply fan, or escape out of doors. The arrangement would allow 100 per cent recirculation while preparing the building for occupancy and would allow any desired percentage of new air from outside during occupancy. Without the automatic shutters in three-story buildings, the residual heat all gets to the top story while the fan is shut down overnight.

5. The admission of air into each classroom would be through six perforated ceiling panels in each room, delivering the air downward at relatively low velocity, with something like 60 square feet of distributed area. It would not be necessary to fur down the ceilings, since in most cases the joists are of concrete and the spaces between some of them can be utilized for air passages. This method of distribution reduces trouble from drafts, gives equal dilution to every zone, and indicates much less dust streaking than does side-wall air introduction.

6. The last place to economize is in the cleanliness of air, and so there would be provided near the supply fan inlet an electronic dust filter. This device arrests the smallest particles of every kind of dust, and may lessen materially the incidence of communicable diseases, as well as reducing maintenance of walls, floors, and ceilings.

7. The boilers, pipes, and heat transmitters would be full of water; not part water and part steam. This water would remain in circulation for indefinite periods, propelled throughout the system by an electric pump. It could be heated to steam temperature in very cold weather, but would be much less hot than steam in mild weather. There would be no traps, reducing valves, or air valves, and there would be no expense or labor for interior cleaning of the boiler heat-absorbing surfaces, since when using the same water, year after year, all mud and precipitable salts in the water would have been removed.

Such a system carefully adapted to the especial situation in each school building would, I am certain, provide maximum comfort, the hygienic well-being of the pupils, effective conditions for learning, and practical economy for the taxpayer, the community, and the school system.

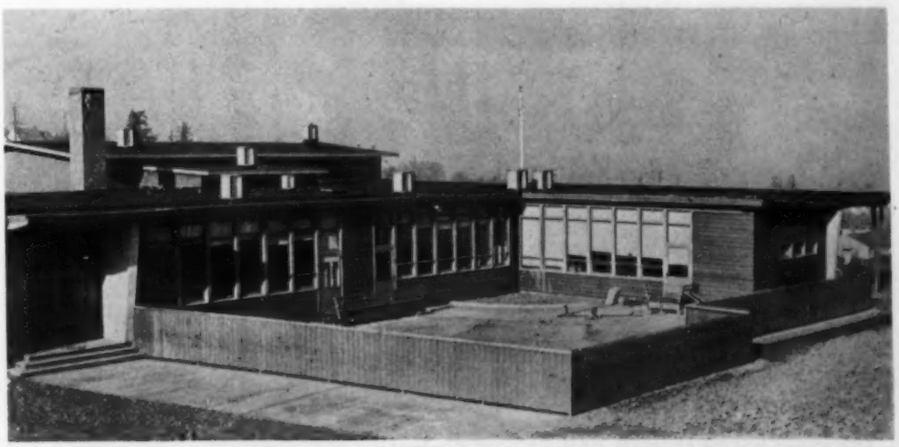
Semi-permanent Schoolhouses in Seattle

Ira T. Miller[1]

With the wartime influx of industrial workers and their families into Seattle the schoolhousing problem became acute. Particularly was this condition true in the elementary grades because the greater number of workers consisted of young men with their wives and small children.

By 1942 enrollment in the grades had risen to 32,063 from 30,180 in 1940. Surveys showed that many more were coming. Seattle elementary schools were filled to capacity even before the sudden wartime population increase and there was little chance that existing schoolhousing facilities could accommodate the new multitude of students.

But another factor made the problem even more complex. The city was short of living accommodations for the workers in the war plants. Consequently, the Federal Government did what it has done in every other wartime industrial center — it constructed housing centers in areas near industrial districts. As a consequence a large percentage of the new school enrollment became concentrated in a few sections of town. Existing schools in those neighborhoods could not absorb such a large increase. Furthermore, the



The kindergarten play court is separated by a fence from the general playground.

[1]Acting Director, Public Relations, Seattle Public Schools, Seattle 9, Wash.

Federal Government constructed two housing projects of such magnitude and at such distance from any city school that it became entirely impractical for the younger children in those projects to attend a city school.

The story of the new school building at either project is the story of both. It is the story of Seattle's first experience with a semi-permanently constructed schoolhouse.

The High Point Federal Housing project consists of 1300 permanent dwelling units, the second largest of its kind in the United States. As the project became occupied a survey revealed that the schoolhousing problem could be solved by the building of a new schoolhouse capable of accommodating 450 students to include kindergarten through the third grade. By use of bus transportation the older pupils could then be accommodated in another city school.

After making application through the Federal Works Agency the school board was awarded government funds under provisions of the Federal Lanham Act. When funds became available it was then the responsibility of the Federal Works Agency to construct the building as an emergency operation.

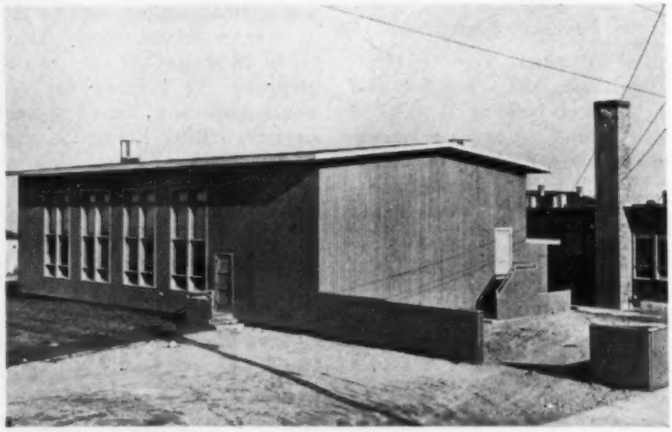
High Point school was completed under the Agency's supervision and was ready for service as a working unit at the beginning of this year's school term. Four hundred thirty-eight children are now enrolled. The building consists of 12 rooms and houses a kindergarten and first, second, and third grades.

It was built at a cost of $101,320 or at approximately $8,400 per room. It is a one-story, part-basement, concrete-foundation frame building with customary plumbing, heating, and electric system.

The building is T shaped, 147 feet by 267 feet over all. The basement contains the boiler room and fuel room, and on the single floor there are ten classrooms, two kindergarten rooms, a kitchen, a combination lunchroom and auditorium, and miscellaneous rooms such as office, storerooms, toilets, and storage.

No provision has been made for covered outdoor play space, nor has landscaping with shrubs and lawn been included. The cost,

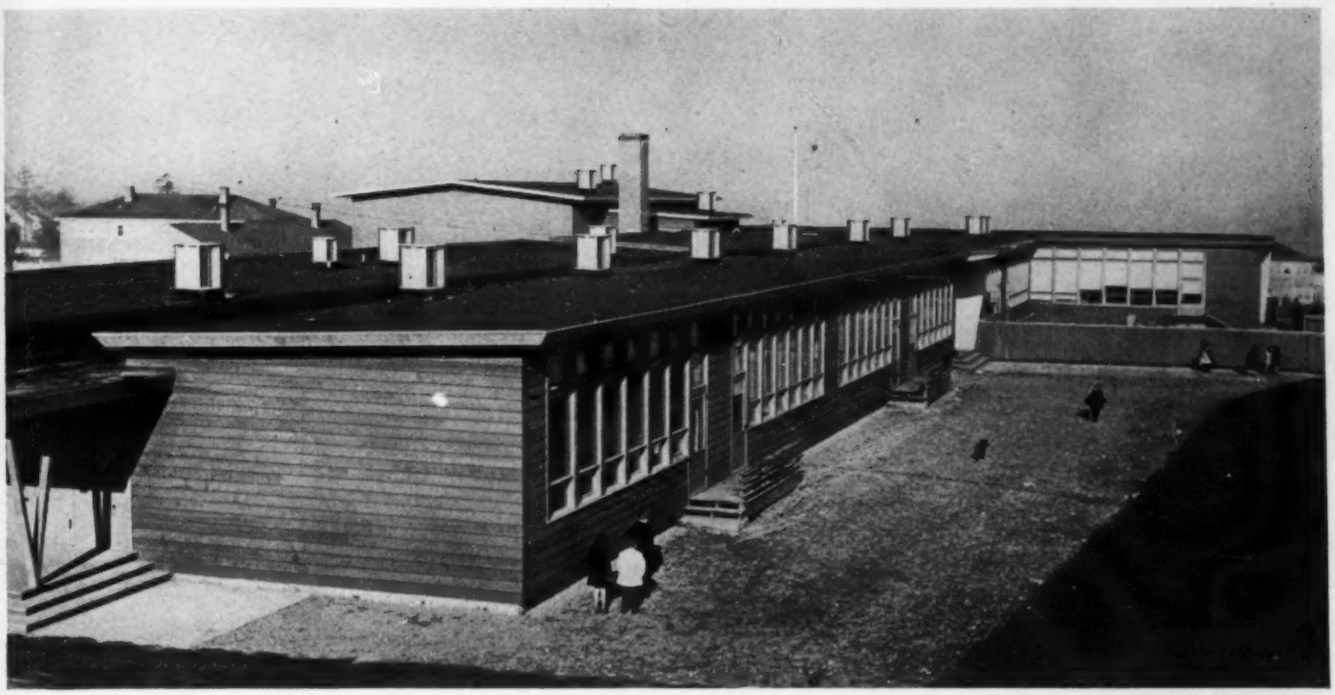
First graders at work. The methods of heating and lighting are evident. The ceiling slopes downward toward the center of the building with the windows at the highest point.



The combination auditorium and lunch room has several outside entrances and receives adequate light from windows to the west.

The main hall is straight and without obstructions. Ribbed glass in the doors and in the upper walls permits ample light on sunny days. Lights are used on dark days.

The auditorium and lunch room has a hardwood floor, plastered walls, and acoustic tile ceiling. Large folding doors give access to the serving tables in the kitchen.



East view of the High Point School showing the outside entrances to each classroom and the individual ventilators on the roof. — Photos by Chet Ullin, Seattle

however, includes furniture, an electric cook stove and other kitchen equipment, and the site grading.

At present costs of material and man power the same structure could have been built of concrete and brick throughout at an estimated cost of $14,000 a room, or at a total cost of approximately $168,000.

In this case there is a difference between the permanent and semipermanent type of construction of about $67,000 or approximately 39 per cent.

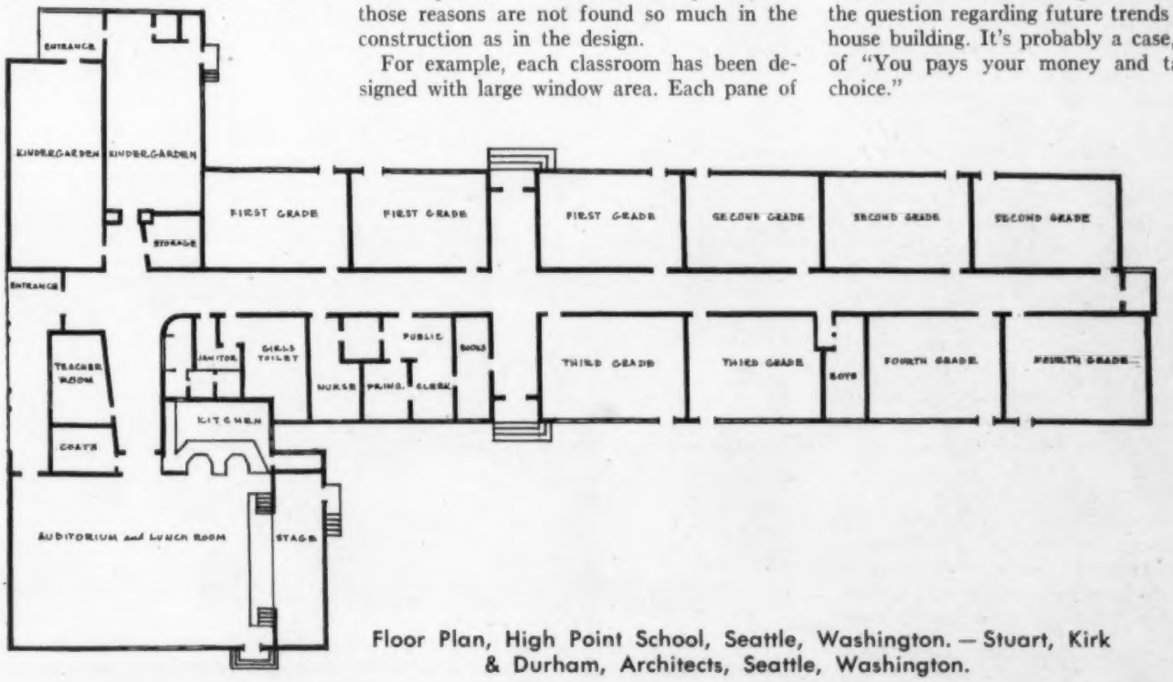
The questions remain: Will this building give as good service 61 per cent as long as a permanent type building would give? Will the trends in school building change radically in the near future so that districts equipped with semipermanent structures will have less hesitation in following new trends than those with more expensive and permanent buildings?

In answering the first question there seems no apparent reason why the High Point school should not give excellent service for almost as many years as any type of construction. There are reasons why the school may be more expensive to maintain and operate, but those reasons are not found so much in the construction as in the design.

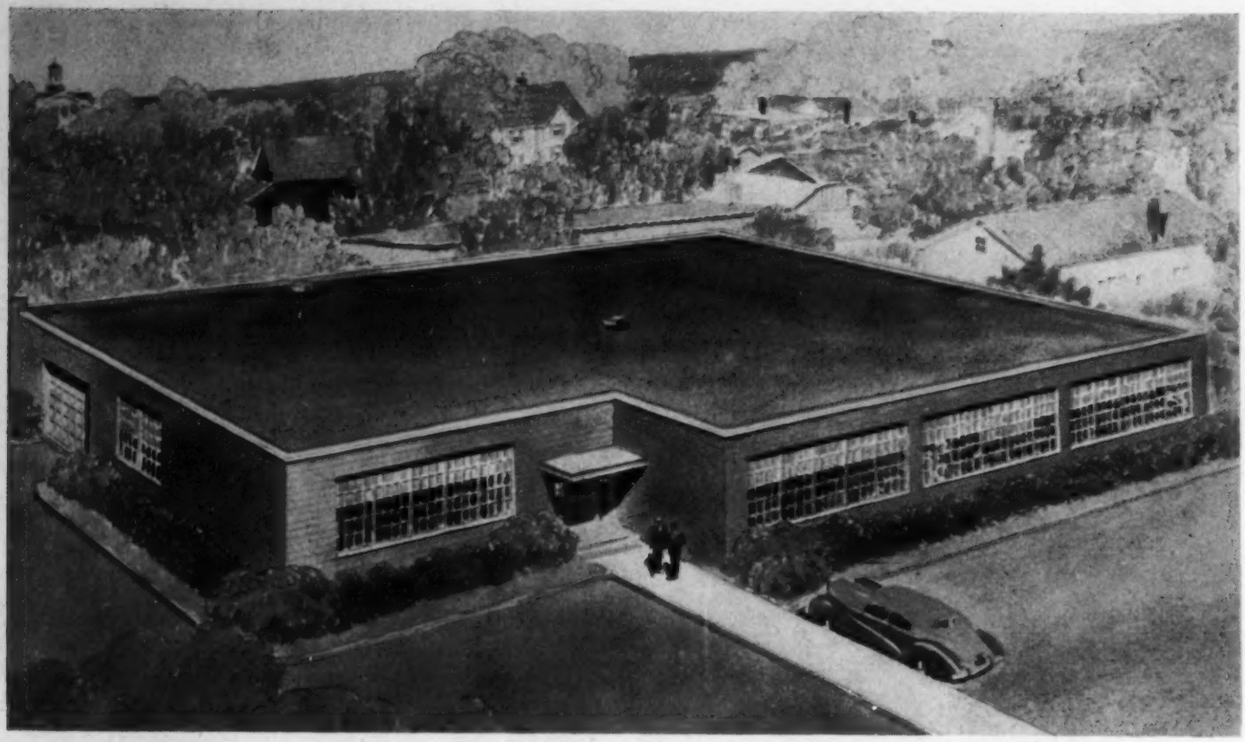
For example, each classroom has been designed with large window area. Each pane of glass is large and would require the labor of two men to replace a broken pane. Experience shows that where there are boys and windows and an occasional pebble, there is a grave likelihood of window breakage.

The large single-glass windows will add to the cost of operation because of the enormous radiation space, and even now before the advent of freezing weather there is some question as to whether the present heating unit will be adequate to overcome the window-space handicap.

The future alone can give the answer to the question regarding future trends in schoolhouse building. It's probably a case, after all, of "You pays your money and takes your choice."



Floor Plan, High Point School, Seattle, Washington. — Stuart, Kirk & Durham, Architects, Seattle, Washington.



— Photographs by Charles Teed, Sidney, New York

Architect's Perspective, Vocational Building, Sidney Central School, Sidney, New York. — Myron A. Jordan, Architect, Richfield Springs, New York.

A Vocational Building for War and Peace

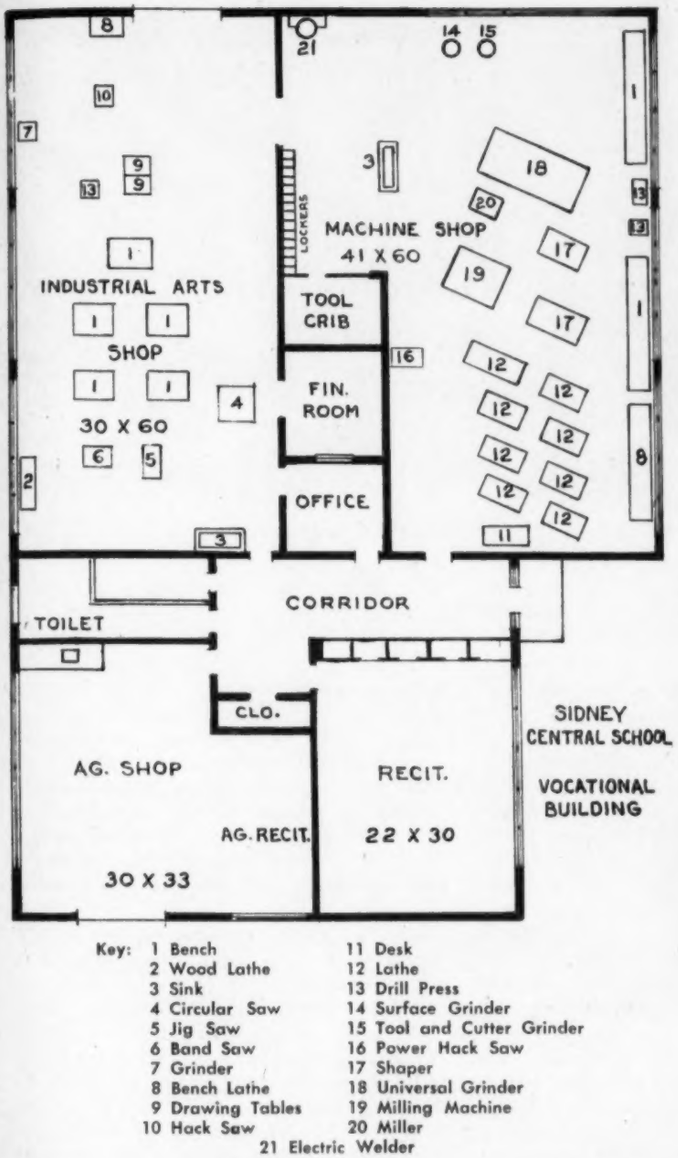
Franklyn S. Barry [1]

Sidney is a small industrial community in the Southern Tier area of New York State. Its largest industry is the Scintilla Magneto Company, a subsidiary of the Bendix Aviation Corporation. The plant in Sidney manufactures magnetos and other ignition equipment for aircraft engines as well as similar equipment for specialized types of internal combustion engines. Because of the nature of its product, the Scintilla Company has been a great force in many phases of community life since the war began. This influence was also felt prior to the war when events throughout the world were pointing toward the present conflict. Expansion took place throughout the past decade at an increasing rate. Employment increased at a tremendous pace, and the need for skilled workers soon exhausted the supply in the entire area.

Obviously the local school was one of the first to feel this impact. Prior to 1938 the school offered four courses in industrial arts and four courses in mechanical drawing to train its graduates for work in the local industry. As the need for more of this type of training became apparent, registration in these

The industrial arts shop is organized on the general shop basis and provides work ranging from simple woodwork through metalwork and aeronautics.

[1]Supervising Principal, Sidney Central School, Sidney, N. Y.



Key:
1 Bench
2 Wood Lathe
3 Sink
4 Circular Saw
5 Jig Saw
6 Band Saw
7 Grinder
8 Bench Lathe
9 Drawing Tables
10 Hack Saw
11 Desk
12 Lathe
13 Drill Press
14 Surface Grinder
15 Tool and Cutter Grinder
16 Power Hack Saw
17 Shaper
18 Universal Grinder
19 Milling Machine
20 Miller
21 Electric Welder

The recitation room serves both for general academic work and mechanical drawing.

The milk testing bench in the agriculture shop is used daily for determining the quality of the milk produced on the students' home farms.

classes increased to such an extent that it became necessary to provide additional space for the industrial-arts program. The department was moved from its small shop in the present high-school building to an abandoned high school near by where an entire floor was available.

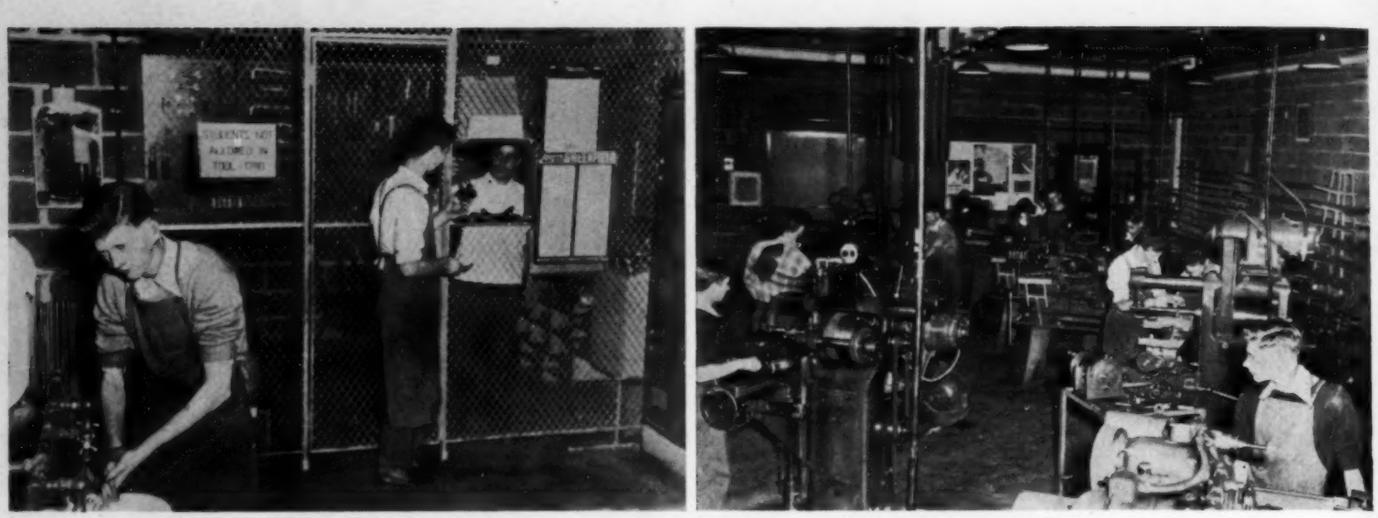
At that time plans were also made with plant officials to set up a machine-shop course for high school graduates in the Sidney area, designed to train boys for the type of work done at the Scintilla Company. In 1939 a bond issue of $8000 was voted to start this program. Additional space in the abandoned high school was made available, and with some new machinery plus machinery donated by the local plant, the program opened in September, 1939. Twenty full-time boys were registered that year. Additional state aid and federal funds, with registration fees, made the program self-supporting from the beginning. One teacher was employed the first year to teach the group. Half of each day was spent in actual machine-shop practice and the remainder of the time was devoted to related work. Original plans called for a two-year course, as well as the employment of two teachers; one for the teaching of shop practice and one for the related work. The program was designed for two groups to make full utilization of the shop possible.

In August, 1940, the school was asked to set up a series of courses to train new employees for the Scintilla Company, and as a result the original program for a two-year, posthigh school machine-trades course was abandoned in favor of the new program. Two classes had been graduated and a follow-up study showed that a year's training had succeeded in making the boys valuable employees.

As the outbreak of the war drew closer, hundreds of new families moved into Sidney and the surrounding area, and the school population increased accordingly. After a thorough study of available facilities it was decided to remodel the building housing the vocational program for use as an elementary school. At the same time plans were formulated for another building to house the machine-trades course, the industrial-arts program, and vocational agriculture.

The Sidney School District at the time was carrying a bonded debt on the present high school building of nearly $300,000. This, plus other issues on a new elementary building, a playground development, and an issue for new buses brought the total bonded debt to approximately 10 per cent of the assessed valuation of the district; a figure above which a school district in New York State is not allowed to go without special permission from the New York State Board of Regents and a two-thirds vote by those voting on the bond issue.

In view of this and in view of the impact of the war on the community, the Federal Government was asked for assistance under provisions of the Lanham Act. Application was made for funds and a grant was made to the school district for the construction of a new building to house the vocational program



Left: the tool crib. Right: general view of the machine shop.

and also for the remodeling of the abandoned high school into an eight-room elementary building. This grant totaled slightly more than $67,000. In the planning that followed, $35,500 was allocated for the vocational program and the remaining $31,500 allocated to the remodeling. At first, it was thought impossible to construct a new building of the desired size in wartime for the money available, but when the four contracts were totaled, the final figure was $35,818! A great deal of planning and economy had made this figure possible and a large amount of credit goes to the architect, Mr. Jordan, and to Mr. Fales and Mr. Lang of the New York State Education Department for the time devoted to the final development of the plans.

The building itself has an over-all length of 103 ft., and a width of 74 ft. and 58 ft. The outside height is 15 ft. 5 in., and the ceiling height 11 ft. 9 in. All walls and partitions with the exception of those in the toilet are of cinder block. Commercial steel sash and precast concrete window sills are used in the building throughout. The roof is of the dead-level, built-up type, laid over ⅞-in. sheathing and 1-in. insulation. This is carried by 2 by 12-in. wood rafters on steel beams. Steel columns located in the outside walls and partitions carry the entire roof load. Roof rafters are double bridged and left exposed. Heat loss with this type of construction seems to be relatively low.

The foundation walls are of poured concrete, 12 in. thick, 5 ft., below grade. The floor has a 2-in. cement finish laid over a 4-in. reinforced concrete slab over a 6-in. tamped gravel fill. It has been necessary on several occasions to use a concrete floor seal and paint throughout the building as the concrete has a tendency to "dust."

The building secures its heat, electricity, and water from the main high school building. Overhead unit heaters with fans heat both of the larger shops, and unit heaters and cast-iron radiation are used to heat the classroom and the agriculture shop. All of these are regulated by automatic temperature controls. All interior piping is carried in pipe trenches below grade. A circulating pump attached to the hot-water line in the main building gives instant hot water throughout the building.

Clocks in all of the rooms, as well as the fire alarm system, are attached to and controlled by similar systems in the main building. Factory-type, R-L-M fixtures, 18 in number, light each of the larger shops with similar fixtures in the tool crib, office, finishing room, agriculture shop, and the machine shop. Flourescent lamps lighting the display cabinet are controlled from the office. All circuits in both the industrial-arts shop and the machine shop are operated from a single panel under the control of the instructor.

Power for machines in the machine shop is obtained from a suspended 3-phase, 220-volt, 375-ampere bus duct. Wall outlets are located in all three shop rooms above bench level at 5-ft. intervals.

The classroom is of standard size, with blackboard on two sides. Bulletin boards cover a large part of the back wall. A black-out curtain makes the room available for motion pictures and other visual aids widely used in this type of education. The woodwork in this room and all other rooms is oak, finished in natural color. Acoustics throughout the building are excellent due to the exposed ceilings and cinder block walls.

The agriculture shop has a small alcove for classwork, and a masonry milk testing bench. A large overhead door allows farm machinery to be brought into the room.

The industrial-arts shop also has an overhead door. Windows and glass doors into the adjoining finishing room and office make supervision possible. Gas outlets in all three shops allow for heat-treating furnaces, and other gas-fired apparatus. The industrial-arts room has an area of slightly more than 1800 square feet and is arranged at present to teach six units of work on a comprehensive shop basis. A gang sink is located near the main entrance. Lumber is stored vertically, and blackboard and bulletin board space has been provided.

The machine shop has a total floor area of slightly more than 2200 square feet and has machines and bench space for approximately 25 workers. A masonry welding booth with an asbestos shield is located in one corner, and fumes are exhausted by a motor-driven fan. This fan also is used to exhaust the dry grinders located near it. A tool crib, separated from the shop by wire screen, is used to store the small tools and equipment. Lockers and a gang sink are located near the front of the tool crib. Each machine is individually lighted. All equipment has been purchased new since 1939 with the exception of one universal-type milling machine. The total investment in machines and small tools is well over $35,000.

The factory-type construction of the building inside and out lends a shop atmosphere not often found in school shops, and in general has been found very satisfactory. After three years of occupation, however, certain changes would be made if the building were to be reconstructed. As mentioned before, the dust from the cement floors in the machine shop which has been a hazard to the precision equipment in this room, has been corrected by use of a cement sealer. The agriculture department is inadequate in size, but its design has worked out satisfactorily. The building should also have an additional classroom. Since aviation has become an important part of the industrial-arts program, a larger shop could be used in this department. The machine shop, both in design and size, has proved very satisfactory. Two toilets would be included in plans for a new building as the need for training both sexes for industry would indicate.

Since August of 1940, over 4000 men and women have received training in the War Industries Training Program operated by the school. Vocational education in Sidney is now a part of the entire community. It has created for the school excellent working relations with industry. It has shown that the school can do a specific job of training. Postwar plans are under way to renew the training of high school graduates for the machine trades and to make this an Area-Vocational School to serve the needs in a large radius about Sidney.

Community Studies in School Planning

Mark Price [1]

In the fall of 1943 the New York City Board of Education was requested by the City Planning Commission to study the school needs that will be associated with a lower Manhattan area in which the Governor Smith Housing Development is to be located after the war.

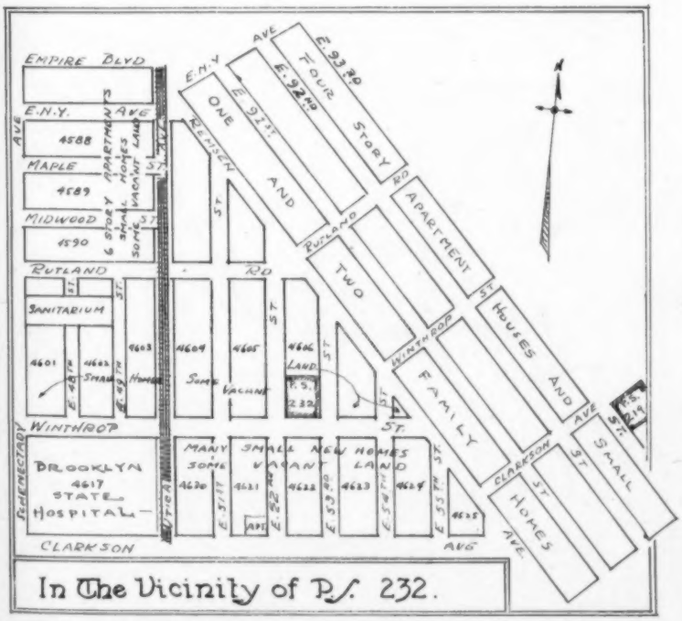
The study, prepared by the Division of Housing and Business Administration under the supervision of Dr. Nickolaus L. Engelhardt, associate superintendent of schools, told a striking story of community life. It gave in considerable detail the area's history and development, the composition of the population, its economic status and education, its recreational, leisure time, religious, and community activities. It described the topography and the soil, the type of employment in which the pepole are engaged, the condition of their houses, the range of their rentals — and it also outlined the probable future of the community.

The findings were not predicated upon personal knowledge and experience concerning the region in question. Rather, they were the product of a careful, intelligent study in which the area was thoroughly explored, photographs were taken, civic leaders and property owners were interviewed, and census tracts and housing statistics were consulted.

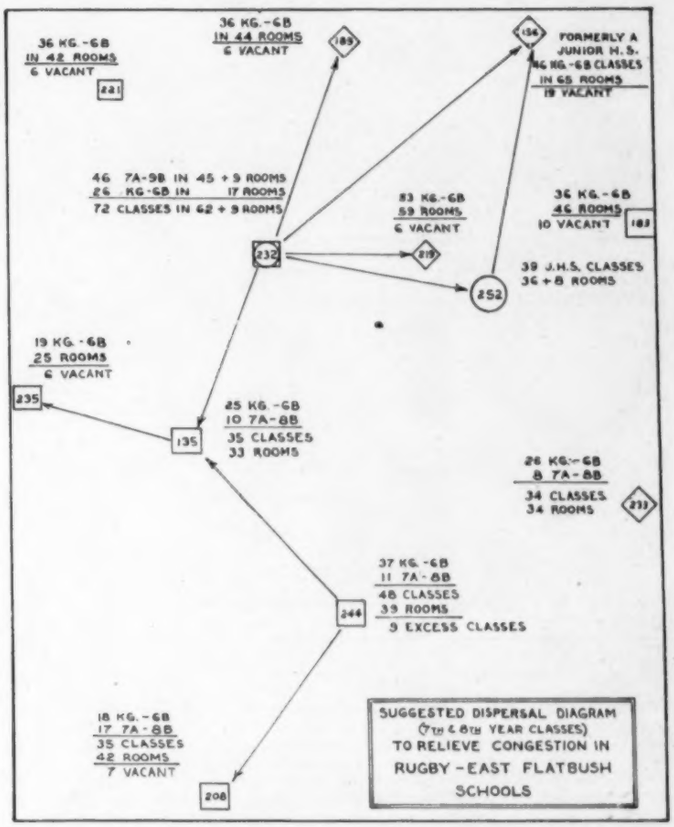
Thus there came into being the "community study," a new element in school planning designed to discover what Dr. Engelhardt describes as "variations in community characteristics." These variations, he contends, determine the differentiations that take place in the educational program of a school.

New York City, like all other large cities, consists of a group of communities. Each one has distinctive features with particularized needs. These hold true with reference to education as well as to other community services. It may be that one community has a large percentage of noncitizen population; another may have a large percentage of college graduates looking toward the advancement of their cultural, social, and economic outlooks; still another may have rentals at the low end of the financial scale, with large families and limited home accommodations. There are many other factors which characterize communities, some more or less on a related plane, others as widely separated as the poles.

[1] New York City Board of Education.



Public School 232 is shown on the above map in relation to the area which it serves. The school is a fireproof building of four stories and basement and serves both as a junior high school and as an elementary school of twenty-six classes.

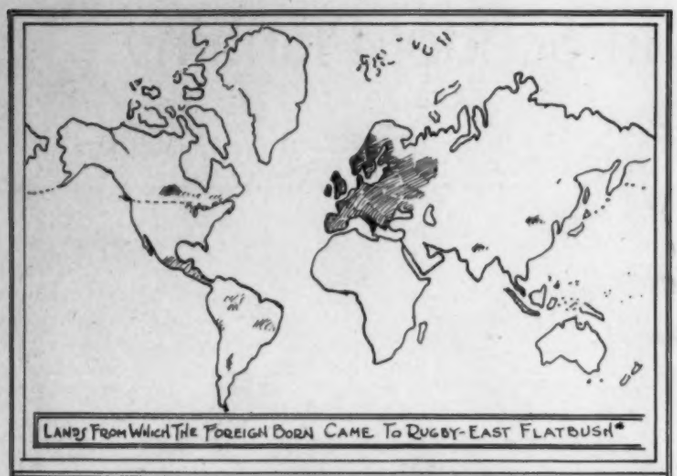

36 KG.-6B IN 42 ROOMS 6 VACANT
221
36 KG.-6B IN 44 ROOMS 6 VACANT
189
134
FORMERLY A JUNIOR H.S. 46 KG.-6B CLASSES IN 65 ROOMS 19 VACANT
46 7A-9B IN 45 + 9 ROOMS
26 KG-6B IN 17 ROOMS
72 CLASSES IN 62 + 9 ROOMS
83 KG.-6B 59 ROOMS 6 VACANT
36 KG.-6B 46 ROOMS 10 VACANT
183
232
219
252
39 J.H.S. CLASSES 36 + 8 ROOMS
19 KG.-6B 25 ROOMS 6 VACANT
235
135
25 KG.-6B 10 7A-8B 35 CLASSES 33 ROOMS
26 KG.-6B 8 7A-8B 34 CLASSES 34 ROOMS
233
37 KG.-6B 11 7A-8B 48 CLASSES 39 ROOMS 9 EXCESS CLASSES
244
18 KG.-6B 17 7A-8B 35 CLASSES 42 ROOMS 7 VACANT
208
SUGGESTED DISPERSAL DIAGRAM (7TH & 8TH YEAR CLASSES) TO RELIEVE CONGESTION IN RUGBY-EAST FLATBUSH SCHOOLS

The erection of a new school building or the discontinuance of an old building requires the intensive study of a dispersal diagram like the above.

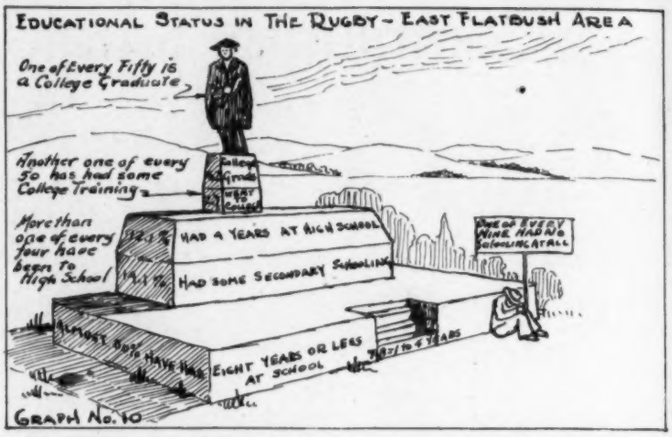
The New York City school system is now endeavoring to serve these varied needs of the people in order that there may be continued growth for all, above the levels of understanding and development which they have so far achieved. In its postwar school-building program, which presently provides for more than 70 new buildings at a cost of $118,000,000, the board of education is placing necessary emphasis on the planning of schools so that they may fit the communities in which they are to be located. Thinking about the schools is being adjusted to the specific requirements of each area.

Over all, however, is the relationship of new school buildings to the Master Plan of the City of New York as developed by the City Planning Commission. The schools of the future have a definite place in this Plan, and no school site may be selected unless it is in conformity with the future plans for a given area in which it is proposed to locate a school. For this reason, the community studies, wherever practicable, indicate new neighborhood projects such as housing developments or highway improvements, to aid the educational authorities in making the most desirable selection of a school site. Once the site has been selected by the board of education, the Planning Commission makes its own investigation, holds public hearings and finally makes its own recommendation to the Board of Estimate, which makes the final choice. Where community studies have been developed, the areas chosen by the board of education were finally selected by both the City Planning Commission and the Board of Estimate.

Six community studies have already been issued by Dr. Engelhardt's division, and others are now in the course of preparation. Five of the studies were prepared by Mortimer C. Cassileth, a member of the staff



The nationality situation in a neighborhood community is made clear to the school authorities by means of graphs and maps.


EDUCATIONAL STATUS IN THE RUGBY-EAST FLATBUSH AREA
One of Every Fifty is a College Graduate
Another one of every 50 has had some College Training
More than one of every four have been to High School
HAD 4 YEARS AT HIGH SCHOOL
HAD SOME SECONDARY SCHOOLING
EIGHT YEARS OR LESS AT SCHOOL
GRAPH No. 10

The cultural status of the parents of children in a neighborhood community must be taken into account in planning for the adult educational use and social center use of a new school building. The graph illustrated is typical of the findings in a neighborhood.

of the Division of Housing and Business Administration, and the other was executed by a private architect under contract to the board of education to prepare plans for a postwar building. All of the studies indicate community needs and school trends as the basis for locating, planning, and equipping school buildings in urban situations.

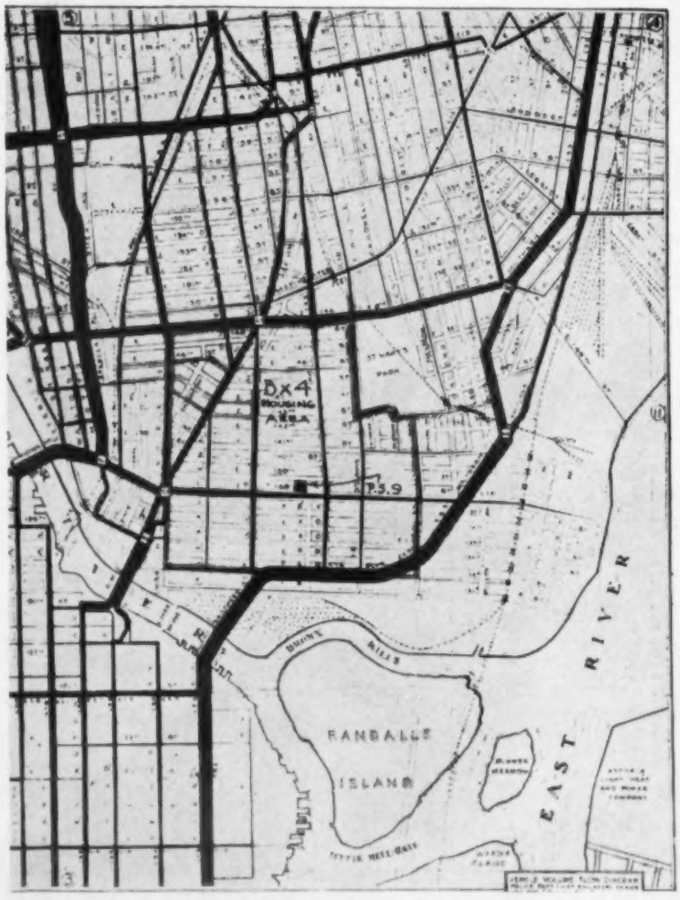
In the lower Manhattan area, for example, the study emphasized the existence of "abandoned dwellings, deteriorated properties, unsupervised social clubs, and the moral and social hazards resulting from them," and continued:

"Educational facilities should take into account the history of the district, and be set up with corrective features in mind. These should include special facilities for avocational and leisure time activities to counteract the basement and store clubs, the pool and billiard parlors which will continue to fringe the neighborhood. Schools should be provided with adequate play space. This is something they now lack."

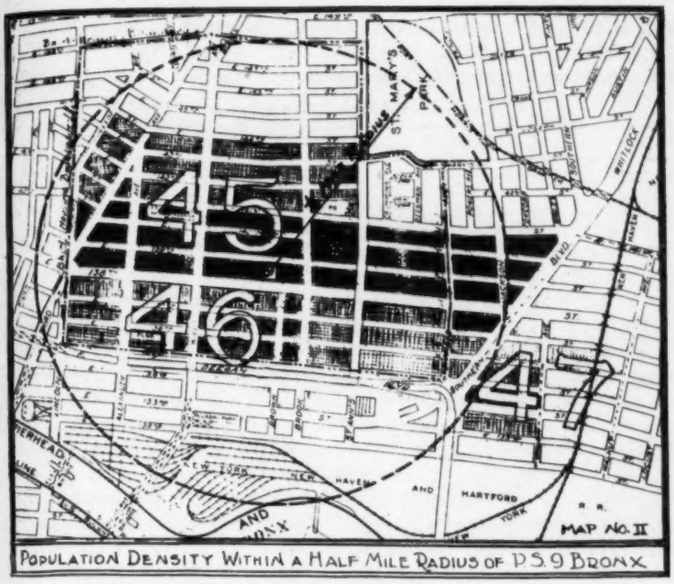
The study further related that the population of the area is "foreign and polyglot," and that even the native born speak with foreign intonations and accents. Seventy per cent of the population never had any schooling beyond the eighth grade, and only one in twelve completed high school.

Out of the wealth of information contained in this study came three alternate recommendations as regards new school facilities: one entailing the construction of a modern elementary school with provisions for kindergarten through the sixth grade and with community facilities, the other two involving modernization of existing elementary school buildings to include such additional facilities as an auditorium, a gymnasium, and a library.

Another study encompassed the Rugby-East Flatbush neighborhood of Brooklyn, consisting largely of small homes and apartment houses in a radius of one mile, where a new school was under consideration. School size, location, and facilities, and the relation of these factors to existing schools in the region, led to the decision to defer the proposed new building until such time as the population experienced further expansion, and that a dispersal plan outlined in the study be followed in placing the area's children in the most convenient and desirable of the present schools. When the need for additional facilities arises, the board of education will have before it a proposal to construct small school units instead of one large building, in order



A traffic flow map indicating the density of travel is helpful in locating new school buildings and in avoiding dangerous street crossings for pupils.



Population density strongly affects both the size of a school building and the extent of the district which it may serve.

Photographs like the above help tell the story of the educational and social center services which a new school building will be required to provide.

that the children would not have to walk excessive distances or to cross heavy-traffic streets.

Replacement of a kindergarten-6B school in a low-income area of the Bronx, presently located adjacent to an elevated transit line, caused another study to be made which resulted in the determination to erect a new and smaller school on the fringe of a park, beyond the noise of the transit line yet close to the center of the anticipated school population of the future. Provision also was made for the acquisition of additional land in the event that future construction of an addition becomes necessary.

In another Bronx area, where a new school is to be erected, the community study showed the need for Americanization classes for a large group of noncitizens as well as a program of adult education. It also recommended a program of afterschool activities for the children, and the inclusion of prekindergarten instruction.

Maps and graphs have an important part in the development of community studies, particularly as they refer to centers of population, distribution of population, and neighborhood traffic. Many of the studies already issued contain on-the-spot photographs to show the type of neighborhood in which it is proposed to provide new school accommodations.

Population maps and their accompanying texts have been very effective in determining school sites. In one study, the center of population was described as about 300 feet due north of the site. "Just a few blocks to the south, freight and train yards, and an intervening section of warehouses, factories, and business establishments thin down the population," the study reported. "Similar conditions prevail to the east. North of the school is a solid residential area where the population is concentrated in a narrow belt."

Another helpful guide in considering the future of New York City's schools is the so-called "reorganization plan," which describes by map and text how the school population in a given area can be reapportioned to be housed in a new school and at the same time provide relief from congestion in existing schools of the district. Typical of the information given to this phase of school planning, are these excerpts taken from one study:

"Public School 165 has a present Kindergarten-6B register of 749. Transferring 300 north to Public School 125 and 250 south to Public School 54 would leave only about 200 elementary pupils in this school, providing it with the relief it needs.

"Public School 54 has a present register of 1268. If 300 pupils should be sent south to Public School 179, then it would offset the receipt of 250 from Public School 165. Anticipating a decline in registers of about 220, the ultimate register of new Public School 54 should be about 1000.

"Public School 179 is south of the Riverside-Manhattanville Area. It has a present register of 1349 pupils in a building of 50 regular and 12 rolling-door rooms. With the increment of 300 pupils from Public School 54, its register would be increased to 1649 elementary school pupils."

The multitude and diversity of information contained in the community studies have been favorably received both by school people and community-minded men and women. They are, as Dr. John E. Wade, New York City's superintendent of schools, wrote in the foreword to one study, "helpful and suggestive to others who are confronted with the problem of planning new schools to meet the needs of oncoming generations of American school children."

The Crusade for Color

John Sharpe Warren

The modern school should exemplify the best in interior decoration. A great deal has been written during the past few years concerning the use of color for interior decoration of school buildings, yet the use of color in our schools is not extensive. It has been found that color, properly used, can produce ideal conditions for learning. A few crusaders have begun to break the drab monotony of schoolrooms with color, and by so doing they have created an ideal psychological environment for the best results in learning.

Proper illumination is needed to make color schemes effective. The conventional color scheme of white ceiling, ivory upper wall, and light buff lower wall has served well in the educational development in America; it has led us to a better understanding of the importance

of light in schoolrooms. There still is a place in modern school decoration for this color scheme, but the time has arrived for more useful, varied, and colorful schoolroom decoration; therefore let us join the crusade for color in the schoolrooms of America.

Special observations have been made of the use of color in the shops and office buildings in New York City. Broadway is a panorama of color; the colorful shops of Fifth Avenue cheerfully invite customers to enter and purchase colorful goods from all parts of the world. Radio City epitomizes modern skillful use of color. Businessmen find that color pays good dividends. Some hospitals have found that special attention to color is very beneficial to patients, especially those afflicted with nervous and mental disorders. School-board members as well as teachers and school administrators cannot afford to ignore the educational and psychological implications of color in interior school decorations.

Color and Color Schemes

Physicists have given us a better understanding of color through the study of light; but the action of pigments which we use does not wholly agree with the physics of color, probably due for the most part to impurities in the pigments. Psychologists have spent much time in experimenting with color preferences of children, men, and women with not too great success. Preferences for small areas of color — with which most of these experiments were concerned — do not correspond with preferences for large areas of color, like the schoolroom. For genuine color preference it is necessary to have the general impression of the whole scheme — floors, walls, ceilings, windows, and draperies — the *Gestalt* if you please. The interior decoration of the schoolroom is far more than its individual parts; it is a unity, a deliberate psychological environment which can be created and utilized for the best of educational results.

There are two general color schemes: color contrast and color harmony. Color contrasts, deftly executed, can produce splendid results, but it is believed that the best psychological environment can be produced by following color harmonies. By using color harmonies there is less likelihood of detracting from the whole purpose of the school, namely, that of being a pleasant environment in which learning may take place. Careful blending of colors can make the room appear spacious and friendly. The warm colors are generally accepted to be red, yellow, cream, and orange. These have a tendency to be cheerful and stimulating. By the same token greens and blues are accepted as the cool colors and tend to be relaxing or subduing. Reds and other pure hues should be used sparingly in the schoolroom. The shades may sometimes be used but it has been found that pastel tints are to be preferred. Well-chosen colors used with care can produce a delightful atmosphere for boys and girls as well as for their teachers.

The location and purpose of the room must be considered when planning decoration. Of the many color combinations to be found two are given here. Dr. H. H. Linn has been using the following painting scheme at Teachers College, Columbia University, for about three years:

Dr. Linn's School Color Schemes

Area	*Wall*	*Ceiling*	*Woodwork*	*Exposure*
Office	Gray-green	White	Gray-green	South
Office	Blue-green	White	Blue-green	West
Office	Sand-gray	White	Sand-gray	South
Office	Peach	White	Peach	South
Library	Green	White	Oak stain	South
Library	Cream	White	Oak stain	West
Classroom	Pale-yellow	White	Blue	North
Classroom	Flesh	Ivory	Gray-blue	West
Classroom	Ivory	White	Gray doors and windows; blue blackboard trim; coral picture molding	
Classroom	Outer wall cream; other walls turquoise blue	Ivory	Same as walls	West
Corridor	Salmon	White	Oak stain	South
Corridor	Peach	White	All wood same as walls, except doors which are cardinal red	

Musick's color schemes, designed to provide a solution to a variety of classroom situations are difficult to accept for they will generally produce classrooms that are too dark. It is of primary importance that the ceilings have high light reflective qualities. The following are Musick's color schemes:

Musick's School Color Schemes

Ceilings	*Walls*	*Dado*	*Woodwork*
Very pale green	Pale green	Grayed brown	Light oak
Ivory	Light tan or buff slightly grayed	Tan (slightly darker than walls)	Light oak
Ivory	Ivory to which has been added a small quantity of raw umber	Same except more raw umber	English oak

There are many other suggested color schemes, the great majority of them ranging between Linn's and Musick's. There are very few cases where the white ceiling is not the most desirable for practically all classrooms. The white ceiling is above the line of vision and certainly aids much in the illumination of the room. If colors must be used on ceilings adequate illumination should be provided.

The reflective value of colors must also be considered when planning the color scheme of the schoolroom. The following data, taken from the *Architectural Record* of April, 1935, agree very closely with other data found on this point.

Reflective Color Values

Color	*Per cent*	*Color*	*Per cent*
White	84.0	Light gray	53.6
Cream	70.4	Light blue	45.5
Light pink	69.4	Sage green	41.0
Ivory	64.3	Aluminum gray	41.9
Yellow	60.5	Brown	23.6
Flesh	56.0	Dark red	14.4
Buff	55.4	Dark green	9.8
Light green	53.6	Dark blue	9.3
		Black	10.0

To whom should we turn for guidance in the selection of color schemes? Acceptable schemes have been found which were worked out by the pupils and their teachers. Some suggest that the job is to be delegated exclusively to the professional interior decorator. A new and great field in interior decoration of schools is open to the professional decorator. Interior decorators who have specialized in home decoration have a tendency to produce work which is too dark and consequently not desirable for schoolrooms, and should be cautioned against it.

Color-Scheme Selection

Because it is believed to have inherent educational advantages this plan of color scheme selection is suggested: that the teachers discuss the color schemes with the pupils of their respective rooms, selecting those considered to be most adequate (this would have a most desirable educational effect); that small committees of teachers take the results, study and revise them; then, that a final committee for the school meet with the administrator and his staff officers to make the final selection; and finally, that they submit the results to a competent interior decorator who has specialized in school decoration. Of course, far less "fuss" will be made by simply letting the school administrator, his staff, the architect and the interior decorator do the work. But the students will be deprived of a wonderful educational experience, and a genuine interest in and appreciation for the final product will be lacking. However, it is necessary to remember that once the walls and floors have been painted it is expensive to make changes. Therefore it is not a bad plan to work out the color scheme in miniature, especially if radical departures are being made. Parents and other citizens of the community will approve of any scheme which makes for a happy and wholesome environment for the children.

Some decorators believe that color schemes of the corridors may be used as an inductive medium to the softer and more pleasing color schemes of the classrooms. Whatever attitude is taken about the decoration of corridors it must be remembered that they are a very important factor in the color scheme of the school. Visitors as well as pupils get their first impression of the school from the corridors. No effort should be spared in making them attractive

and educational. Well-lighted and colorful display cabinets should be built into the walls. These display cabinets may be used for both educational and publicity purposes. A school can have no better publicity than that of exhibiting its good work.

Materials for Color Effects

There are many materials on the market for producing varied and desirable color schemes. Modern manufacturers can be depended upon to produce all the color desired in any materials, especially after the crusade for color gains more momentum. There is practically no need for semigloss and gloss oil paints in interior school decorations. The great variety of colors, and possible color combinations, of mat (or flat) oil paints should be in great demand. The casein paints are gaining favor because of their soft finish. The uses of calcimine are so few as far as the schools are concerned that nothing would be lost by eliminating it.

Plywood, knotted woods, maple floors, tile, tinted glass, glass bricks, linoleum with its many patterns and colors, and even washable wallpapers and other materials have their places in color schemes of schoolrooms. Some very fine results, for example, are being produced in tile where picture stories such as the Mother Goose Rhymes are used in kindergartens. The study of the many interesting materials is well worth one's time. Lack of color in schoolrooms certainly is not due to a lack of desirable materials. There are places in the school for murals and paintings, especially in corridors, cafeterias, gymnasiums, and auditoriums. These can be not only educative but also important in the general color scheme. Curtains and draperies, when well chosen, may aid much in producing desirable results. Venetian blinds may even be employed with good results. Nevertheless, draperies and curtains should never be allowed to impair the illumination in schoolrooms. After a room has been decorated in a color scheme it will often be found necessary to refinish picture frames, map cases, and other items in order that they may become a part of the color harmony of the room.

Generally, skilled workmen should be employed to do the decoration, however, there are cases where the children may not only do excellent work but may also gain lasting attitudes and appreciations. Kindergartens and lower grade children may be permitted to do a great deal of decoration, usually with water colors. The upper grade boys and girls can frequently produce superb results in murals, the plans for which are often of their own creation. There are many practical jobs which may be done by the boys in the vocational shops and the girls from the homemaking departments. Educators should use these opportunities for student participation in the interior decorating of the school, particularly when they promise lasting educational benefits.

Schools for Recreation for Tomorrow

Katherine Glover[1]

Across the desks of the Recreation Division of the Office of Community War Services come constant reports from communities in all parts of the country in which schools are being utilized as community recreation centers. One such report, typical of many, records that:

> A comprehensive program of community recreation, to be carried out this fall and winter in six centers established in public schools throughout the city, as recommended by the Mayor's Recreation Committee, was given unanimous approval yesterday by the Park Commission and now goes to the School Department for its approval.

This is from Springfield, Massachusetts. Another, from Richmond, Virginia, tells of 17 school community centers, open every afternoon from 3:30 to 5:30 and every evening from 7:30 to 9:30, for adults and young people 16 years and over, with Friday evenings reserved as party nights for youngsters from 12 to 16 years.

Berkeley and Oakland, California, throughout the year operate school playgrounds and gyms after school hours and on Saturdays and Sundays. The Taft, California, school department has sponsored an evening program for teen-agers during the past eight months at the high school building and also at one of the elementary school buildings.

Madison, Wisconsin, keeps ten of its schools open on Saturday when 2300 boys and girls of the city enjoy a wide range of recreation activities — sports and games, dancing and dramatics, crafts, music, story-telling, gymnastics, wrestling, and motion pictures.

[1]Information Service, Division of Recreation, Federal Security Agency, Washington, D. C.

At the conference of the Connecticut State Recreation Committee called by the Governor in April 1944, a resolution was adopted:

> WHEREAS the post-war period is apt to bring an extensive school building program including consolidated schools, regional high schools, replacements of out-moded schools and remodeling of many more; and
> WHEREAS all such new construction should be available and suitable for community recreation at a minimum expenditure for operation and maintenance;
> BE IT RESOLVED that this Conference urge all state and local authorities having control to insist that all new school construction shall be planned to serve the community's recreational needs.

A similar resolution was passed at the conference of the Maine State Recreation Committee called by the Governor in May 1944. The North Carolina State Recreation Committee is encouraging wider utilization of the school plant for community life as a part of a 20-point recreation program for the state. West Virginia is asking its school superintendents to encourage community use of school facilities and to promote school programs which invite community-wide participation, such as dramatic plays, community sings, music festivals, athletic leagues, use of machine shops.

These are just a few of many examples of growing use of schools by communities.

Wider Uses Since War Began

Those schoolhouses which have stayed locked and barred after school hours and sessions have been particularly out of line during the war; for the watchword has been full utilization of all our resources. Popular demand, the necessity to economize in buildings, the expanding need for all available recreation facilities, the large-scale program of extended school services, all these have served to open many school doors, brought school playgrounds into round-the-clock use, opened classrooms, shops, auditoriums, and gyms for a wide gamut of use by those of all ages. This wider use of school buildings must, of necessity, be safeguarded by definite administrative regulations and controls.

Such new impacts upon our schools, converting them into focal centers of neighborhood life, mean inevitable changes in the school plant. The negative attitude of some school officials toward community use of school buildings, has been due, in part, to the difficulties involved in multiple-use of buildings which have been rigidly planned for the traditional school program. From now on in the planning of school buildings, a different concept of the services of the school needs to be in the mind of planners at the outset, a concept that will take shape in brick and stone, functional plan and design.

The insulated school, like the insulated curriculum, has no part in the dynamic life that will follow this war, in which we hope to see our democracy recharged, freshly vitalized. Communities have a right to look to the schools as the most important single institution to interpret to their populations the changes we may logically expect in the post-war world.

One of the changes which seems inevitable is increasing leisure, due to the necessity to assure full employment — in the face of technological improvements which shrink the labor required in many fields of production. Schools must not only provide physical facilities and programs for the profitable direction of this increasing leisure for many adults

and for young people, but also must prepare children for the creative use of this valuable gift of time. This means schools differently planned, equipped, and operated.

Another of the changes to which we may look forward is the expansion of our international responsibility, with the comparable need to expand our understanding and our culture. What does this mean in terms of school buildings? It means that community by community, schools must help to familiarize people, of all ages, with the best in ideas, literature, music, arts of our own and other nations, so that we may build a strong and sound nation for ourselves and contribute to unity among nations.

It must be recognized that many of our school buildings represent a heavy investment, especially those built during the lush days of the 20's, yet with slight modifications they can be adapted to meet the expanding services. It is hopeful, however, that in anticipation of an extensive school-building program after the war, plans for new schoolhouses are on the drawing boards and in the blueprint stage. Many of these, happily, represent in their plans the modern concept of the community school.

Flexibility Needed

It would be impertinent for a layman to attempt to outline the points of departure in design of the new schools, beyond the general statement that they should represent in their structural plan the flexibility of the multiple uses they should serve. This means units for public use so designed that they can be cut off from the remainder of the building, for economy of heating, lighting and care, and for ease of access. It means that shops, laboratories, workrooms, serving the community as well as the school children, must provide for extra locker space and in some instances, extra or double-use equipment.

Many cities are planning their schools so that adjacent plots of land can be purchased to serve as playgrounds and athletic fields. Ideally, there will be few new schools which would not be set in the midst of park acreage providing not only for playgrounds but for school gardens, an amphitheater, and, where possible, a swimming pool. Where it is practical for schools to be situated on the periphery of cities, they may well provide small or large wooded areas, perhaps even a school farm, and farm workshops. These will offer a variety of laboratories outside as well as inside the school. In such schools city and country will meet.

Above all else, if the layman again may speak, one would hope to see the school of every local town and village express in its architecture something of the character of the region, springing out of local roots. The glory of this country is its geographical variety, the colorful differences in the history of its different sections. Why should not those differences be expressed in the architecture of our schools? Let's be done with schools that are imitations of Tudor mansions set down in prairie towns, or replicas of Greek temples incongruously dotting modern industrial towns. California has set an example by adopting in its schools the Spanish architecture native to the state and fitting its climate and topography.

The formal, traditional, and too often forbidding school building shutting children in and the public out must give way to a building that combines school with something of the old town hall, which serves as a pulsing center of neighborhood interests; a plant which economically houses on one campus many facilities — for recreation, for adult education, for arts, of and for and by the people. Such a plant, particularly in a rural area or small town, may well combine in its interior, theater and auditorium, museum, craft shop, gymnasium; and in its exterior, athletic fields and playgrounds for full community use.

The Community Should Participate

When a town or community builds a new school it should be a thrilling adventure, rousing the interest of all its citizens. A schoolhouse should never be built in a vacuum of public ignorance. At every stage, people should keep abreast of what the new school building will be like, be fully familiar with the details of financing, construction, plans, have a voice in its location. They should have an opportunity to see photographs and films of other schools in order to compare the design of their own with the best in other cities.

The President has said: "We Americans . . . are builders." There is no direction in which the passion for building might more constructively turn than in planning the schools of tomorrow.

The Modern School Building

R. A. Sutherland[1]

Up-to-date schools housed in attractive new buildings are the desire of educators, parents, and pupils. Very soon many new schoolhouses will be built, and right now many school authorities and school patrons are asking, What is the modern school building? This question is answered variously, so that most citizens are at a loss to reach a satisfactory conclusion. However, the variation in ideas expressed does not mean that only one authority can be right. Several conflicting opinions may be sound and correct. A building design to be functionally correct must be adapted to use. This use must depend upon the type of students and teachers, as well as the methods and ends of instruction.

When I am thinking primarily of the building in this discussion, I cannot divorce my subject for the complicated practices of general education. The essence of great architecture is the adaptation of structure to use. In the past the masterpieces have been only those in which the materials have been adapted in their use to fulfill the needs of utility. The Parthenon of Athens and Chartres Cathedral, though of radically different design and construction, are masterpieces in which the utilitarian purposes for which they were created are expressed perfectly.

Danger of Copying Old Buildings

In planning new schools, this first fundamental principle of good architecture must be borne in mind. Our buildings must be designed so that they really serve the purpose for which they were created, utilizing to the best advantage the materials and scientific skills available. Building committees are too prone to demand that a new building be similar to some other structure with which they are familiar. Because an existing building has certain features is no reason for accepting it as desirable. Most of the terrible old schoolhouses we see today were dedicated with cheers years ago — and then copied without critical judgment on their shortcomings.

The best modern school building will be the one that best accommodates the modern teacher and his pupils and facilitates a modern program of instruction. There is a vast difference in the teaching methods between the discourses used by Plato and his students, and the modern teacher and her classes. A room adequate for one is a failure for the other. To be sure it would be a rare privilege to have our students sit at the feet of such an intellectual giant like Plato regardless of surroundings. We know that genius can overcome any handicaps. However, the difficulty of imparting knowledge to the modern American youth is such that handicaps are not excusable.

Dangers of Standardization

The purpose of the building is to serve education. What is the purpose of education? As a layman, I would answer: To develop well-rounded human personalities, and to train American citizens to carry on the best traditions of America. To serve such an educational program school buildings have two functions to perform: (*a*) of providing material shelter and (*b*) of creating lasting inspiration for the tasks in hand. This is not a too difficult job. The first need is cooperation of school authorities and architects with the teaching staff. The second need is that of thorough study and the use of experienced skill.

We talk of the standardization of classrooms as though the product of the school were a machine part. The American can never be that. The true purpose of education must be the development of the individual; it must include the development of his ability to cooperate with the group. One frequent criticism of the larger school sys-

[1]Master in Architecture, Milwaukee, Wis.

tems of today is that there are two groups of students not effectually provided for. One of these groups is the lower mental group, and the other the exceptionally brilliant students. This also is the problem of the architect.

When we adopt any standardization in classroom size, without careful consideration, we are sidestepping the problem. Any standardization defeats its purpose. The ideal modern school must adapt itself to the changing needs of teaching. This cannot be dogmatized by slide-rule methods.

Several types of modern classrooms, developed in southern California, with movable partitions, cross ventilation, and adjustable daylight control from different sides of the room, are meeting the problem in an ideal way. For the rank and file of schools this may seem impossible. However, if the case is stated clearly, the mechanics can be developed to meet the needs. Certainly we could have adjustable partitions that can adjust the several classrooms in a building to the different classes at the beginning of the year. Such classrooms will then be adapted according to the needs of the work, and the teaching will not be dictated by a standardized classroom. Why should all the classrooms be the same size and type when the teaching needs are dissimilar? Modern school architecture must adapt itself to the problem at hand. The training to be given in the school is the only dictate of building design. Standardization is permissible only in a few cases. Copying other buildings is an inexcusable anachronism. Our cities are full of these outmoded buildings. If originally they had been designed to meet the needs of teaching and had not been copied one from the other, they would in most cases still be useful.

Larger Classrooms?

A recent authority has said that the classroom must be made five feet longer to accommodate a more varied program. This is a useful thought. It would give the teacher a chance for free grouping of different kinds of work, all going on at the same time. However, the teacher may well be distrustful for she knows that, if the classroom can accommodate more pupils, the chances are that extra children will be added at some time because of some so-called emergency. A midwest city kindergarten now has 140 pupils because of a very commodious room provided in the past. High school classes of 48 and grade school classes of 50 are not the exception. It may be possible that future teaching methods will make this larger number of pupils per teacher possible and desirable, and certainly it is not wise for the architect to argue with educators. However, the designer of schools must be familiar with the trends in education and plan accordingly.

The opinion of most educators seems to be that the ideal number of pupils for the teacher to give the best attention to is around 28 or not more than 30. This makes possible the personal attention so necessary for individual progress. If the school system can adhere to this number, all is well and the buildings should be planned accordingly. For this type of teaching the classrooms can be arranged to avoid monotony and to take care of the specific character of the work.

If the trend in education is toward a lower operating cost, and not toward a more efficient educational work, then larger numbers of pupils must be taken care of per classroom. This is especially true of shopwork, home economics, and other specialized teaching. There are arguments in favor of this development, and it is the architect's duty, as well as the school board's duty, to be familiar with it and to plan accordingly. However, true economy in educational work is more than book learning and must be judged by the final product.

In insisting upon this freedom of plan I may not seem to be as practical as I should, especially since public building committees want hard facts. Medical practice cannot be dictated to by rule-of-thumb methods, neither can architecture. If cheap education is desired, cheap both in first cost and cheap in the quality of the human product, rule-of-thumb is acceptable. This is, however, not what the American people want. So modern school planning must consist of analyzing the complete teaching problem as it exists and arranging the buildings for the work to be accomplished.

Exterior Design and Planning

The exterior design and architectural embellishments of the school building must carry out this theme of efficiency. By this I do not mean that the building must be "modern" in style. The style should express the plan. Education cannot be made effective on a production-line basis, hence the exterior of the school building must not look like a factory. Some modernists have thought that by throwing away all semblance to past architectural styles they could create something new and desirable. This does not follow. The architectural design of every period in history is the expression of the age. The great styles of the past, such as the Gothic and classic, perfectly express the age of their development. This present age has many characteristics of the times which have gone before, but we have added something that is distinctly our own. The real modern architecture will express this spirit of today in an appropriate way.

Architecture can be likened to a vocabulary. A successful author studies the masterpieces of the past and adapts that which is fitted to his task. He would not think of copying the Bible or Shakespeare or, in fact, any other classic, but he does have them as a background, and he does and must use the vocabulary and the basic means of expression already developed. He frequently uses similar sentences, or as the case warrants, similar phrasing. This is good writing and common sense. For an author to start out and develop an entirely new language with original sentence structure and vocabulary would take more than a lifetime. This cannot be done successfully and leave time to any one man to apply this new language to original works of literature. No more can an architect forget what is past and create a new and successful architecture that has no affiliation with other men's work. Novelty is desirable only if it is appropriate. Originality in the extreme is acceptable only when it best solves a problem in hand. It has taken centuries to develop our modern literature and, while there is a considerable gulf between the writings of Chaucer and Chesterton, still it is easy to trace the development from the past to the present. So architectural styles as they record the development of mankind and changes in civilization have evolved one from the other in a manner clearly recorded. Modern architecture to be successful must be cognizant of this fact.

Modernism and Good Design

Certain underlying principles of design are to be found in all masterpieces. Architects must follow these universal principles if modern buildings are to be successful. Fads have characterized school-building design during the past few years. Recently the fad has seemed to tend toward freakishness. This effort based on the desire to be original might be excusable if the basic principles of design had not been violated, but mostly they have been. Fundamentally, the indispensable elements are unity, coherence, and emphasis. These will always be found in every good plan. Then it is up to the architect to express these characteristics of his plan in the exterior.

This point of view would eliminate consideration of factory-type designs applied to schools; not that ornamentation is necessary. Within limits ornamentation is desirable, but it will not make a poor building good looking. If the essentials of good composition are adhered to, the structure will be good looking. If appropriate ornamentation is added, its attractiveness will be enhanced. This can help endear the building to the community.

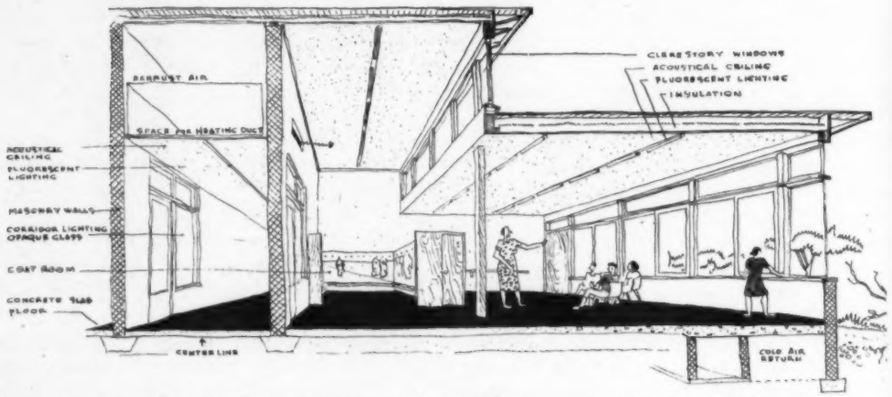
As we look over the many obsolete school buildings in cities and towns, we cannot help but feel that the reason they are obsolete is not that they are old; not that material, money, or skill were lacking at the time they were built, but that they were designed without consideration of the fundamentals of good teaching which were true then as now. If our forefathers had analyzed the teaching job in the eighties and nineties, as they should have, and had built accordingly, most of the buildings they put up would not now be obsolete. The basic needs of education have not changed, the characteristics of youth are not fundamentally different, and the personality of good teachers is very similar. It was ignorance and indifference that created the poor school buildings of the past. Then as now, the tendency was to copy and use rules-of-thumb, and not to think through the problem.

The scientific approach to the planning of the modern school is through a careful analysis of the needs — learning as well as teaching. Correctly meeting these needs will create the finest modern schools.

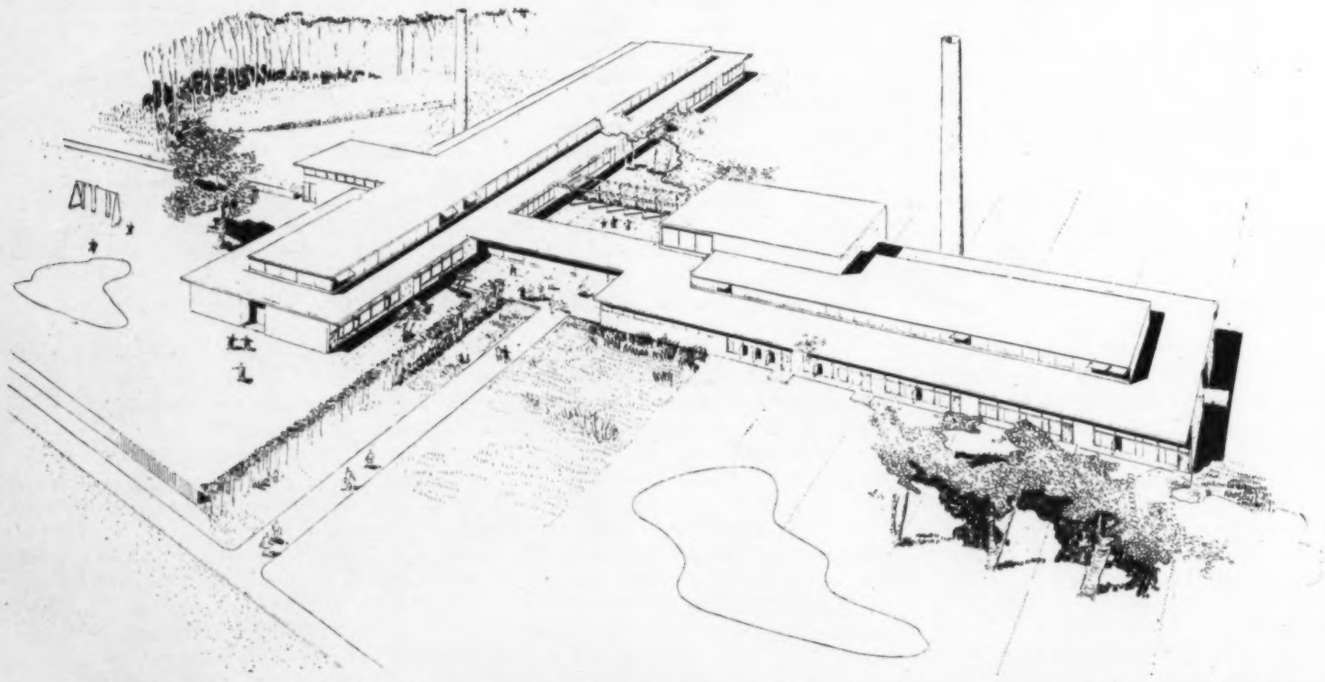
The Ross School, Willow Run, Michigan. — Saarinen & Swanson, Architects, Birmingham, Michigan.

The Willow Run School Buildings

The community of Willow Run Village represents an interesting war development in which an entire community was brought into being within a very few months. The housing of the people who are warworkers in an ordnance and other war plants involved the planning and erection of homes, shops, office buildings, churches, public health, and community buildings, and very important school buildings.



Section of typical classroom and corridor arrangement in Elementary Schools, Willow Run, Michigan.



Aerial view of Elementary School, Willow Run, Michigan. — Saarinen & Swanson, Architects, Birmingham, Michigan.

When the first of the new schoolhouses were opened in the fall of 1943, the community included nearly 1700 families, coming from 42 states, from Cuba, Porto Rico, and even from South America. By far the largest number of families came from Kentucky.

The planning and construction of the school buildings, the first of which was partially occupied in September, 1943, was entrusted to the famous architectural firm of Saarinen & Swanson, of Birmingham, Mich. The buildings are of the permanent type, with masonry walls coated with cement, concrete floor slabs, and wooden roof and window construction.

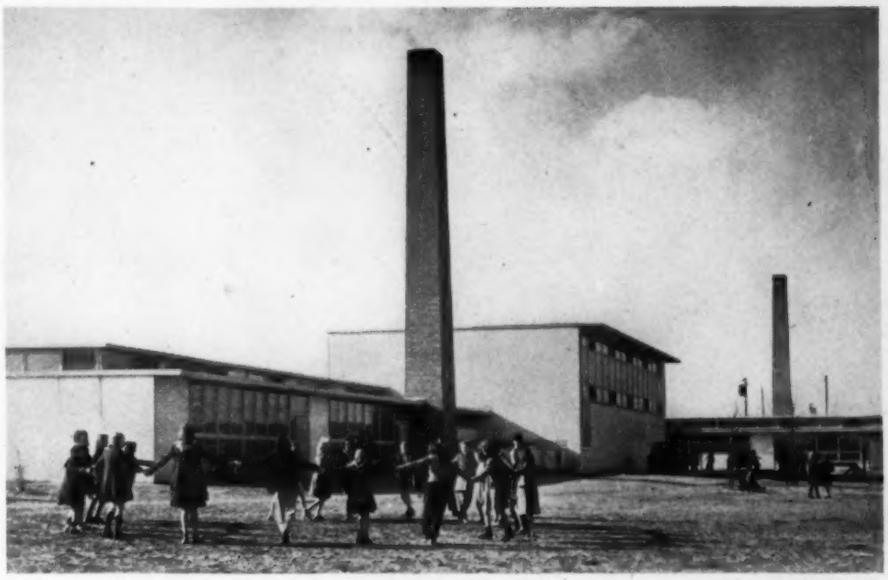
The classrooms are a distinct departure from the conventional classroom erected in the North Central States. A typical classroom measures 25 feet in width by 32 feet in length, with space for a coat room and an activity alcove. The section of the room nearest the outside windows is 8 feet 6 inches high. The interior section is 13 feet 10 inches high and is lighted by means of clere-story windows.

The classroom walls are plastered and the ceilings are covered with acoustical materials. For dark days fluorescent lights are provided.

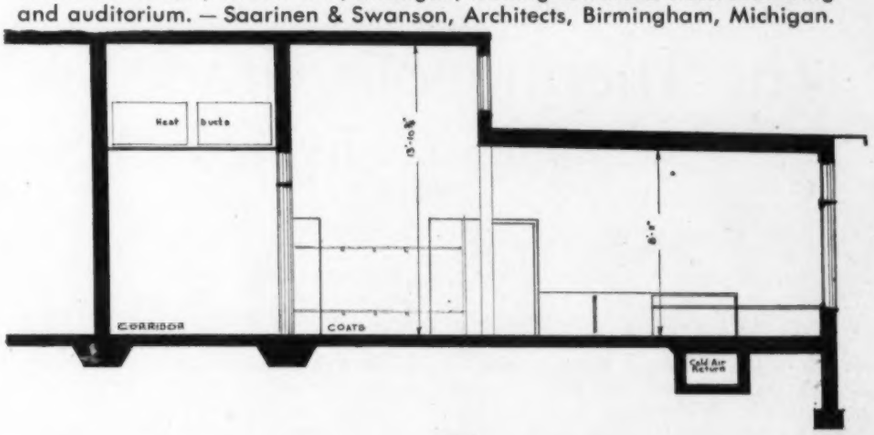
Heating and ventilation are provided by means of a steam central fan system, with ducts carried in the space above the central corridor and return air ducts under the classroom floors.

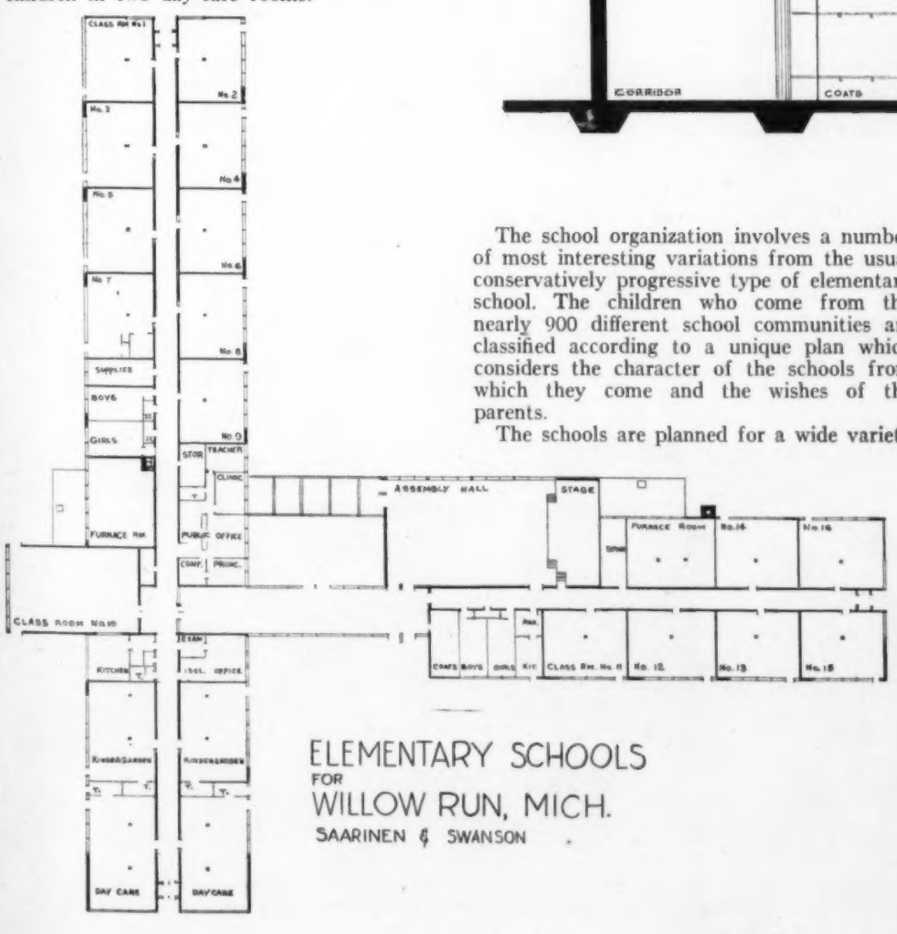
The plan of the Ross School, shown in the accompanying illustrations, is typical of all the buildings.

Each of the schools is planned to accommodate a normal load of 700 children and to take care of varying small groups of nursery children in two day-care rooms.



The Foster School, Willow Run, Michigan, looking toward a classroom wing and auditorium. — Saarinen & Swanson, Architects, Birmingham, Michigan.

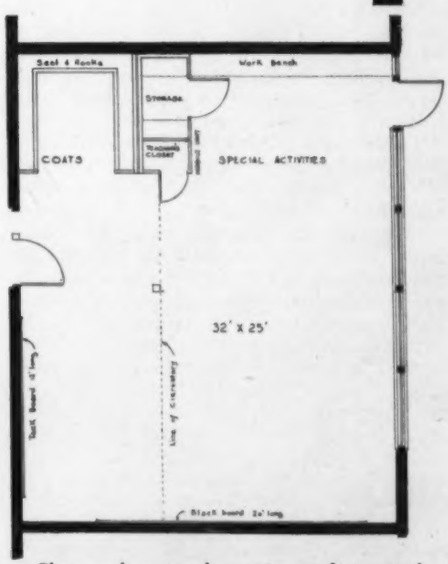




ELEMENTARY SCHOOLS
FOR
WILLOW RUN, MICH.
SAARINEN & SWANSON

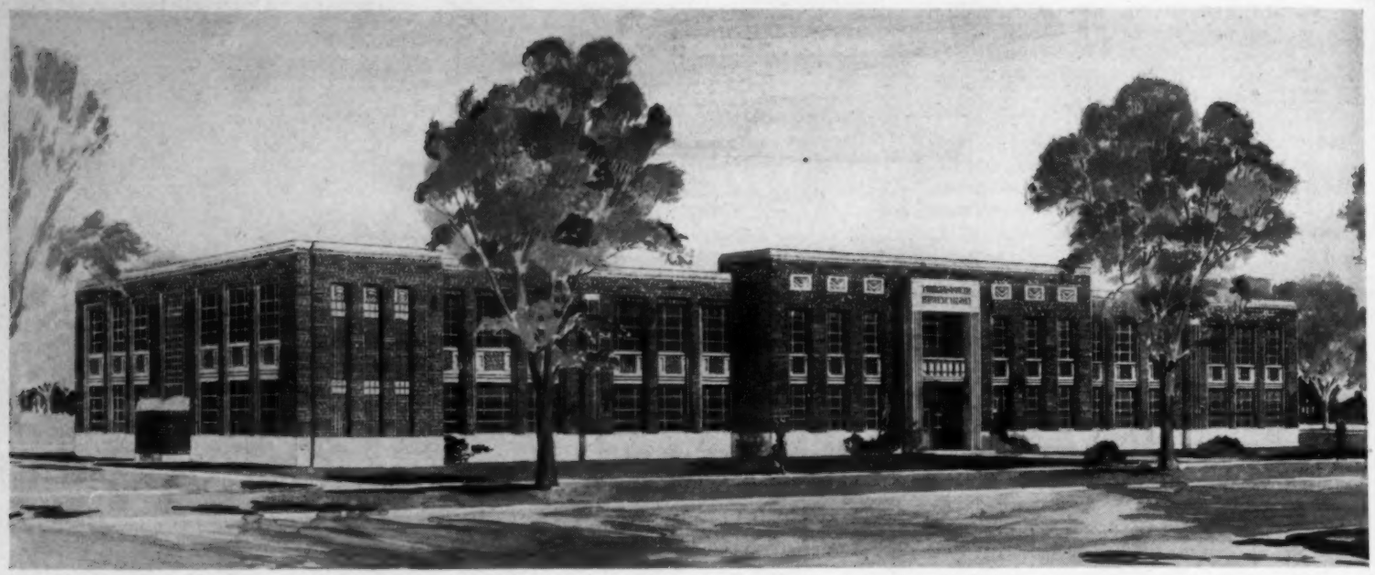
The school organization involves a number of most interesting variations from the usual conservatively progressive type of elementary school. The children who come from the nearly 900 different school communities are classified according to a unique plan which considers the character of the schools from which they come and the wishes of the parents.

The schools are planned for a wide variety



Floor plan and section of typical classroom, Elementary Schools, Willow Run, Michigan.

of community services and are providing a splendid means for an enriched type of recreational program.



General Exterior, Grade and Junior High School, Thermopolis, Wyoming. — Goodrich & Krusmark, Architects, Casper, Wyo.

The Thermopolis Grade and Junior High School

E. Joe Rush [1]

The people of Thermopolis, Wyo., are indeed proud of their new $180,000 grade school building completed under the recent PWA program.

In many localities in the West it has been the practice to allow the grade school to take over the old high school building while a new building is erected for the secondary school children. Many times these old high schools are not suited to the grade school program. In Thermopolis the new building was designed and planned particularly for grade school work, and as a result is mentioned as an outstanding grade school structure in the state.

Thermopolis is a western town of 2500 population, situated in the center of Wyoming at the mouth of the beautiful Wind River Canyon. Livestock, coal mines, oil fields, and tourists are the principal industries. Many people come to Thermopolis to take the hot mineral baths and cures for many ailments, and as a result the school population is somewhat transient. It is not uncommon to gain or lose as many as fourteen pupils in a single week. The people of Thermopolis have taken a particular pride in their schools for some time and want their educational facilities to be ranked at the top. Health seekers have soughht to bring their families here for the winter, because the education of their children will in no way be slighted.

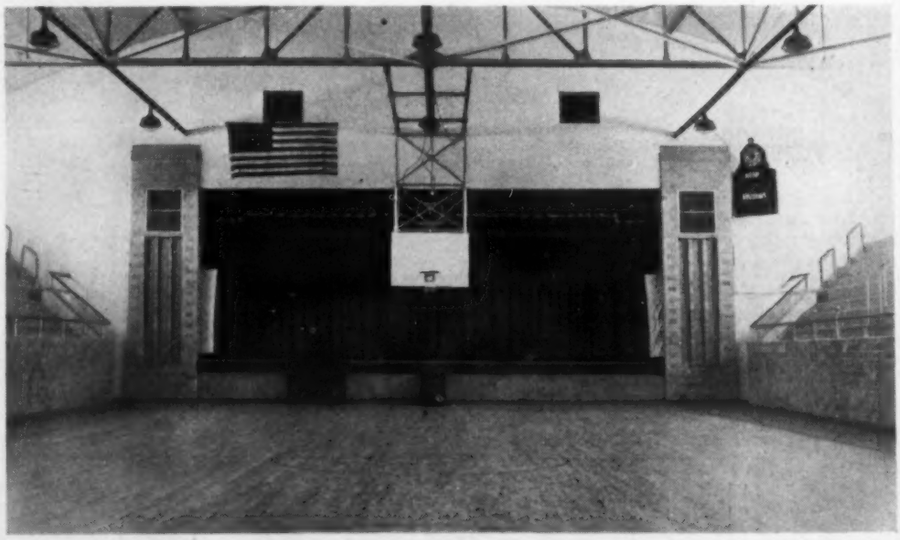
In order to erect the building, it was necessary to provide only $97,000 by the sale of bonds; $80,000 was received as an outright grant from PWA, $2,400 was taken from cash on hand to apply on equipment.

The building is two stories high and of brick construction, utilizing glass brick wherever possible, and is trimmed with artificial stone. The structure is of the conventional "T" design. The front is 256 feet long by 60 feet wide, with the gymnasium 82 feet wide, running 108 feet to the rear. The building houses 14 classrooms, a large study hall, a lunchroom, a kitchen, a combination gymnasium and auditorium. Provision has been made for future expansion, and all rooms are above ground. Fireproof construction is used throughout with the exception of the roof over the gymnasium which is of timber construction carried on steel trusses.

Halls and corridors are of ample width, floored with asphalt tile, and have a wainscot 6 feet high of buff glazed tile. Light is borrowed from the classrooms by use of glass brick. Ramps are used in place of stairs at the main entrance and have proved very satisfactory for quick, noiseless traffic. Ceilings throughout, except in toilets and utility rooms, are covered with sound-absorbing acoustical material.

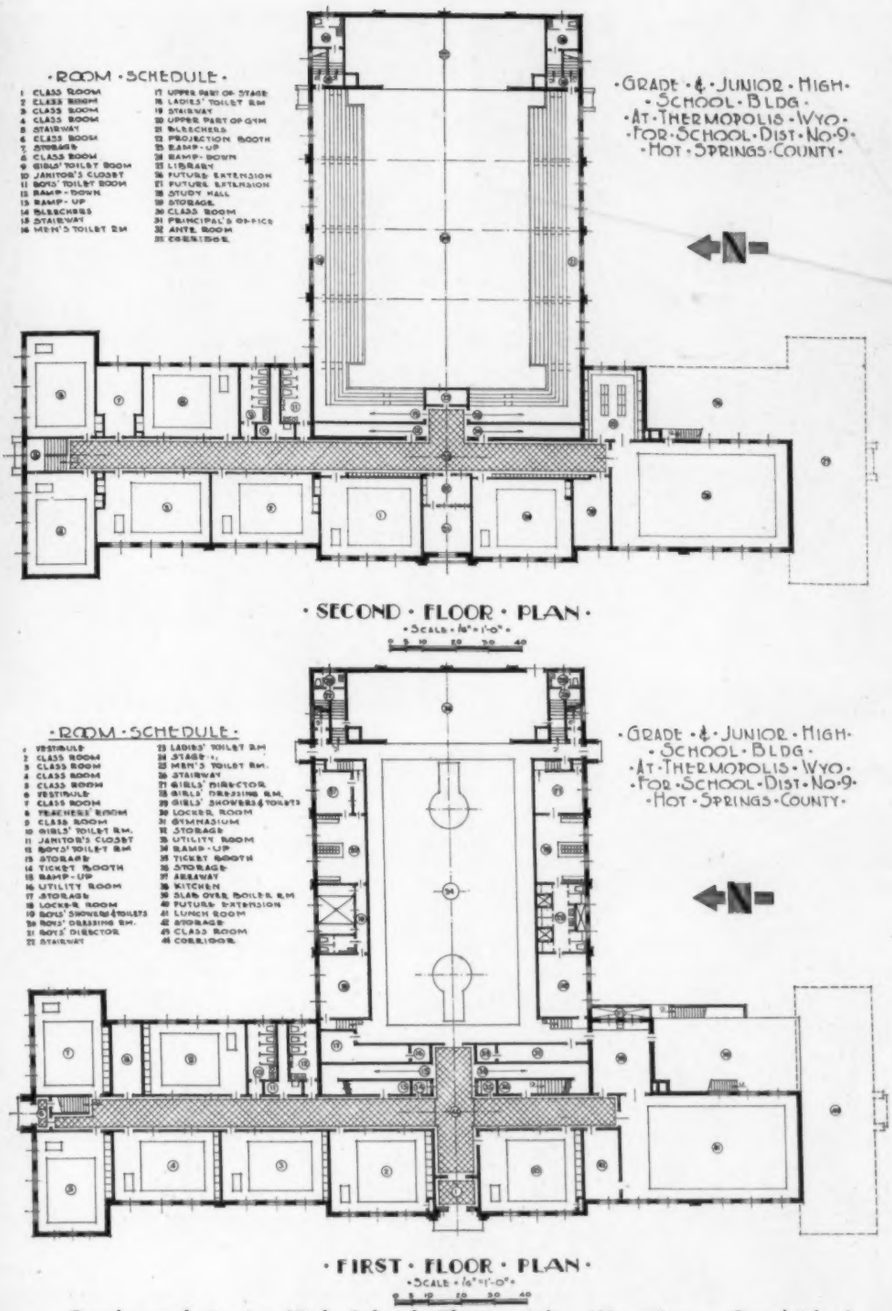
Large steel grills roll down from the ceiling when the gymnasium-auditorium is used for games or entertainments, shutting off the rest of the building from the public.

The gymnasium has a floor 50 by 90 feet



Hard maple floors, glazed tile wainscoting, and plastered walls have been used in the auditorium-gymnasium at Thermopolis.

[1] Superintendent of Schools, District No. 9, Hot Springs County, Wyo.


ROOM SCHEDULE
GRADE & JUNIOR HIGH SCHOOL BLDG. AT THERMOPOLIS WYO. FOR SCHOOL DIST. NO. 9 HOT SPRINGS COUNTY
N
SECOND FLOOR PLAN
SCALE 1/8" = 1'-0"
ROOM SCHEDULE
GRADE & JUNIOR HIGH SCHOOL BLDG. AT THERMOPOLIS WYO. FOR SCHOOL DIST. NO. 9 HOT SPRINGS COUNTY
N
FIRST FLOOR PLAN
SCALE 1/8" = 1'-0"

Grade and Junior High School, Thermopolis, Wyoming. — Goodrich & Krusmark, Architects, Casper, Wyoming.

Glazed tile in harmonious coloring brightens the main corridor of the Thermopolis School.

with concrete bleachers on each side and a large stage at one end with a 40-foot proscenium arch. Here all school assemblies and contests are held. The basket in front of the stage swings up to the ceiling. The dressing rooms are under the bleachers. A large band room, beneath the stage, is finished with insulation board, rather than plaster, to absorb the sound.

The gymnasium and toilet walls are lined with buff glazed tile to a point 7 feet above the floor.

The classrooms are all equipped with "no draft" windows and individual air-conditioning units. Floors are asphalt tile, and teacher-controlled wardrobes are used in place of coat rooms.

The building is equipped with a central sound control cabinet and has a speaker in each room which allows two-way communication. Radio and other programs are used often over this system.

Natural gas is used to generate steam for heat, using a two-pipe vapor system. An instantaneous water heater furnishes abundant hot water for all purposes and is proving very satisfactory. Stand-by coal-fired equipment is in place for use should gas supply fail.

A WPA landscape project has covered the playgrounds with sand, and large areas of flagstone have been placed around each entrance to cut down the sand and dirt tracked into the building. The stone is native limestone placed on a four-inch cushion of sand. The driveway is also made of heavy flag stone.

Grade and Junior High School, Thermopolis, Wyoming.

A corner of the lunch kitchen in the Thermopolis School.

The Grade School, Lingle, Wyoming, has a beautifully landscaped setting.

Pupils from the surrounding country are conveyed in buses to this school from the south, north and west, in one case as far as 35 miles.

The Lingle Grade School

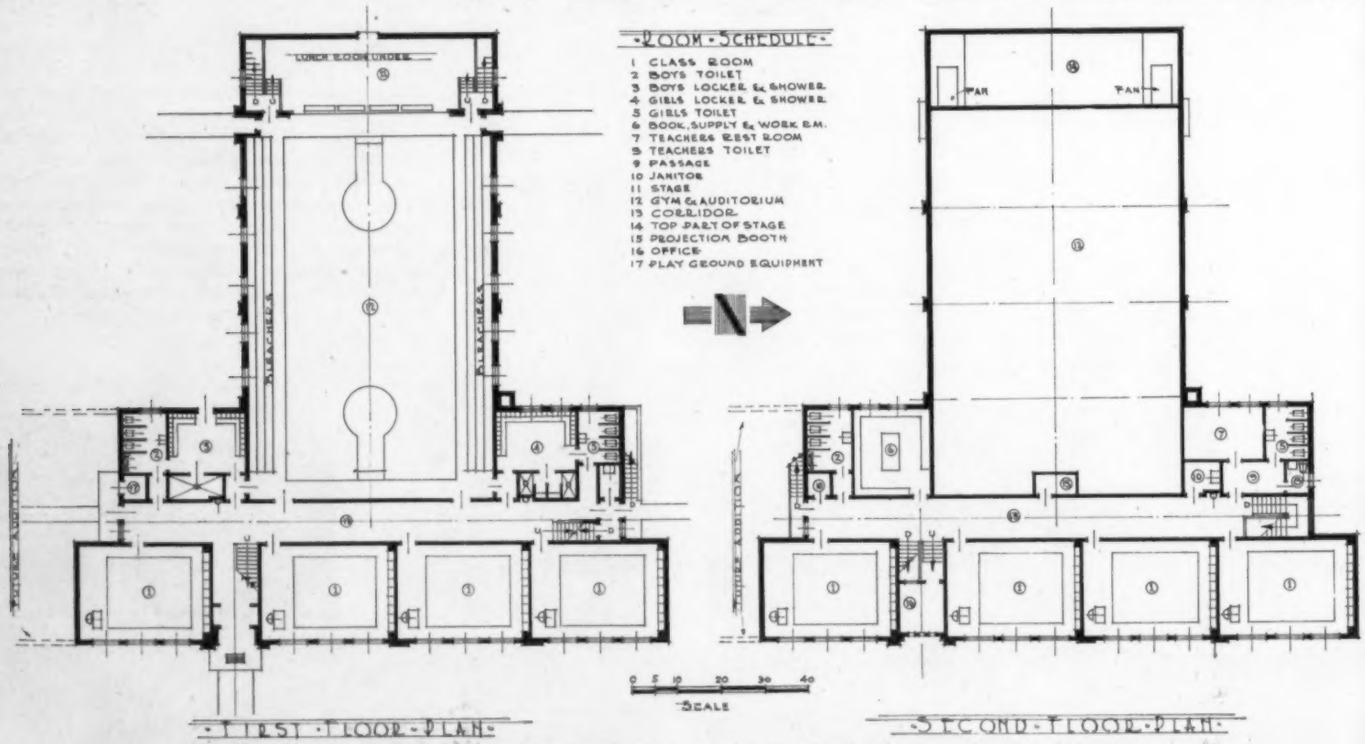
J. C. Corbett [1]

The drinking fountains in the Lingle School are set in niches lined with glazed tile.

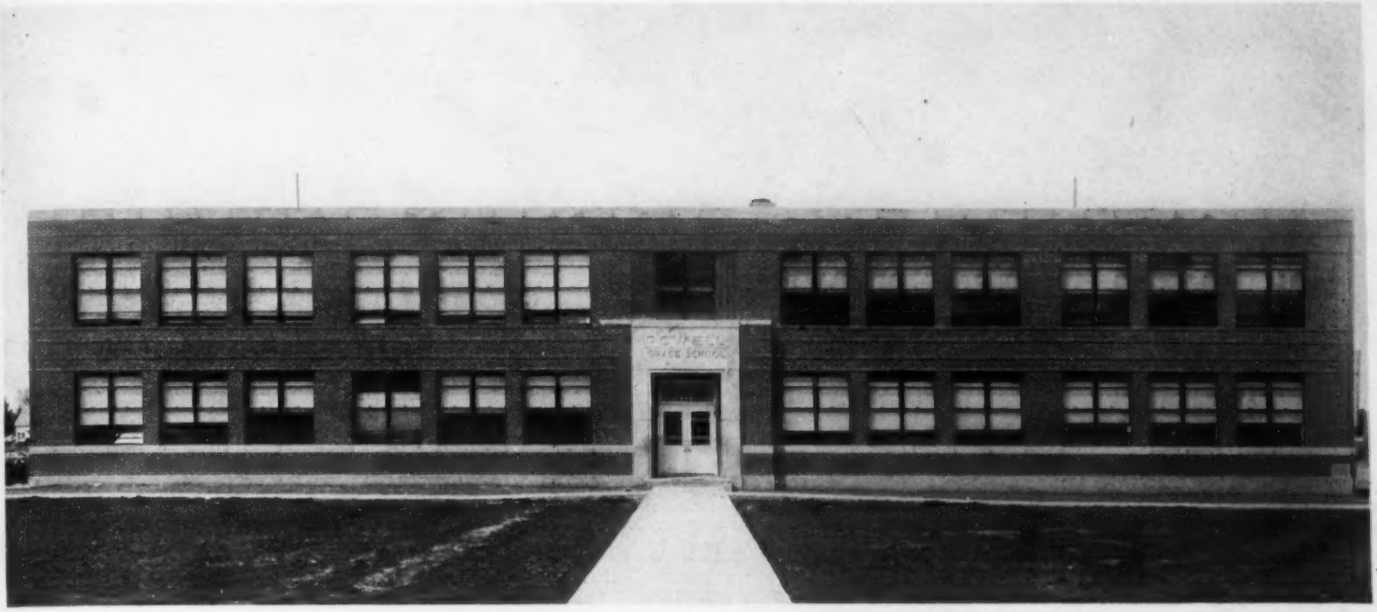
In 1938 the lower six grades of the Lingle public school system were housed in a frame building composed of eight rooms, constructed by gradual additions to a smaller building erected around 1914. At this time the sanitary and safety conditions were deplorable and the rooms were badly crowded. The school district had no means to provide for an auditorium and gymnasium of a modern school plant.

It was agreed by the board of education that an attempt to construct a new grade building with the aid of the Public Works Administration should be made. Mr. L. C. Goodrich of the firm of Goodrich and Krusmark, architects, of Casper, Wyo., was consulted and the needs of the school system were outlined to him. He made a survey of the requirements and submitted preliminary drawings and specifications and estimated the construction cost of the pro-

[1]Superintendent of Schools for School District No. 2, Lingle, Goshen County, Wyo., at the time the building was built.



Grade School, Lingle, Wyoming. — Goodrich & Krusmark, Architects, Casper, Wyoming.



General Exterior View, Powell Grade School, Powell, Wyoming.

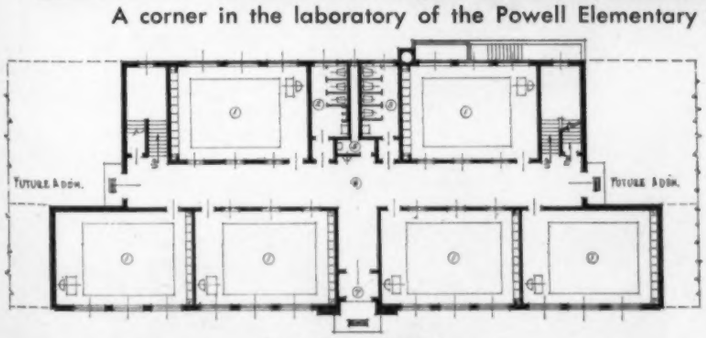
A corner in the laboratory of the Powell Elementary School.

posed building at about $80,000 complete with plumbing and heating and some of the essential equipment. These proposals were forwarded to the Public Works Administration and approved by the Omaha office.

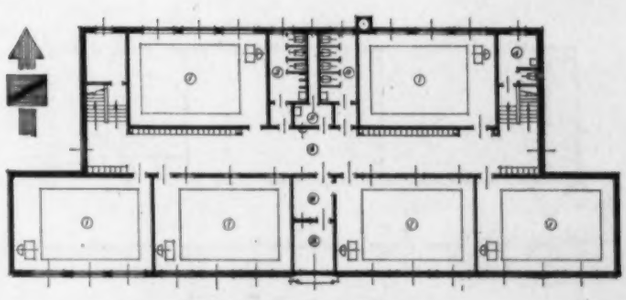
The plans were accepted and the School District advertised for the bids on the construction of this building. The firm of H. H. Hackett of Rapid City, S. Dak., was awarded the construction contract, and B. F. Rankin of Torrington, Wyo., the contract for the plumbing and heating. The actual construction began on November 10, 1938, and the building was completed in early September, 1939.

The funds for this project consisted of a $37,000 P.W.A. grant; $46,000 from the sale of bonds, and a $2,000 building fund. The question of issuing bonds was decided by a vote of the qualified voters of the School District with only seven dissenting votes.

An interesting problem was presented by the fact that $75,000 in bonds had been issued at a time when the district comprised what is now four separate districts. The fact that these bonds were charged against School District No. 2 made it seem that the $46,000 would exceed the legal maximum for this purpose. However, a ruling was finally



First Floor Plan

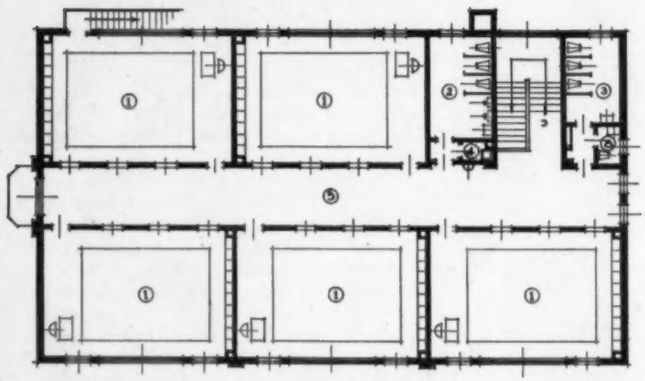


Second Floor Plan

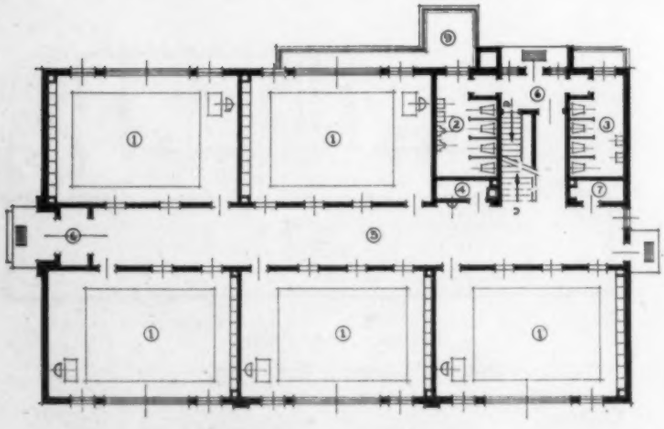
Grade School, Powell, Wyoming. — Goodrich & Krusmark, Architects, Casper, Wyoming.

Room Schedule:
1 Classroom
2 Boys' Toilet
3 Girls' Toilet
4 Teachers' Rest Room
5 Janitors' Closet
6 Corridor
7 Vestibule
8 and 9 Office

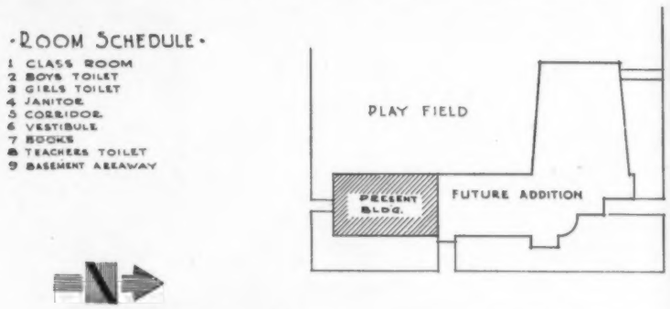
The Riverton Elementary School, Riverton, Wyoming, represents a bold experiment in the use of glass block lighting.



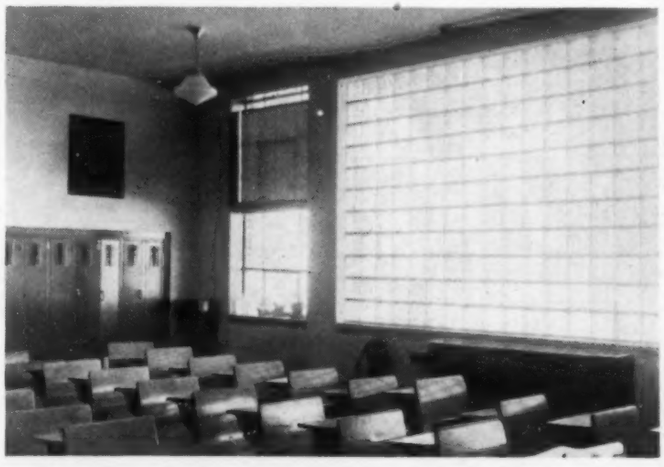
Second Floor Plan



First Floor Plan



Grade School, Riverton, Wyoming. — Goodrich & Krusmark, Architects, Casper, Wyoming.



The Elementary School at Riverton depends on glass blocks for the main illumination of the classrooms. Steel fenestra at each end of the room provide for a view of the outdoors.

made by the Attorney General which allowed bonds to be issued to the extent of $46,000. The bids for construction, submitted by the successful bidders, were sufficiently low to allow the inclusion of several alternates: a public-address system, stage scenery, the decoration of classrooms, and approximately 150 desks and other furniture.

Some of the pleasing features of this building are the asphalt tile flooring in the classrooms, modern heating and ventilating units, ceramic tile in corridors and lavatories, glass-block lighting in the halls and stair landing, safety treads on all stairs and landings.

It will be noted that the building consists of eight classrooms, toilets for boys and girls on both floors, a supply room, an office, a gymnasium, and a small stage. The gymnasium is used by the grades and by the High School which is located a short distance north of the grade school.

The building is of fireproof construction, with rough wire-cut face-brick exterior and stone trim. Gas-fired boilers provide vapor steam through unit heaters in the classrooms, blowers in the gymnasium, and radiators elsewhere.

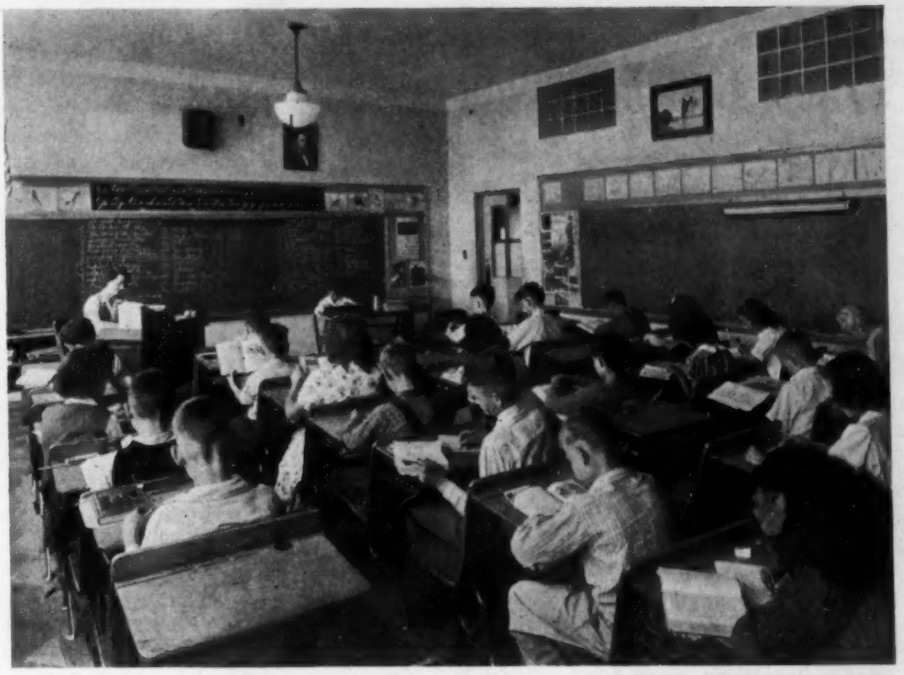
The building has been in efficient use for almost five school terms. The new auditorium and gymnasium have enabled us to provide an efficient physical-education program for the grades as well as the High School.

A well-equipped lunchroom under the stage allows the school to serve hot lunches to most of the 250 children transported from the rural areas.

The fact that a recent epidemic of influenza which hit this section of the country, causing attendance to drop to less than half in some schools, was hardly noticed. In Lingle may be an indication that the use of correct ventilation and sanitation is an important health factor.

In the construction of this project there were four parties involved: (1) the school district, represented by the board of education consisting of Mr. H. S. Kirk, President, Charles Hollingsworth, Earl Baker, George Tapster, Paul Dupertuis, A. J. Haeffelin, and Hugh Frances; (2) the Architects, Goodrich and Krusmark, with Mr. L. C. Goodrich in charge; (3) the contractors, H. H. Hackett and B. F. Rankin; and (4) The Works Progress Administration, with Mr. Bruce Norfolk as Resident Engineer, and Mr. Hollingsworth, a member of the board of education. The spirit of cooperation which was shown by each of these parties was outstanding and resulted in a job well done and a source of satisfaction to all concerned.

The fact that many community gatherings as well as school activities are held in this building is an indication that the democratic way of life is fostered by such a project.



The grade classrooms are fitted with blackboards, ample tackboard space, radio, and unit ventilation. Glass blocks and glazed doors add to the borrowed light of the corridors.

The Riverton Primary School

Martha Petersdorf[1] *and James H. Moore*[2]

Since the fall of 1940, the children of Riverton, Wyo., have enjoyed the facilities of a two-story, ten-room school plant planned to relieve the existing congestion in the elementary schools. In locating the building on the site and in laying out its facilities, consideration has been given to the fact that the community is growing and that the school program is being broadened from year to year. The additions to the building will consist of classrooms, an auditorium-gymnasium, a library, and practical-arts facilities.

The building is a red brick structure, with a glass-brick section in the outside wall of each classroom. The north-south hallways receive additional light through sections of glass brick high along the interior walls of each room. All rooms receive direct sunlight either in the morning or during the afternoon.

Since the building was planned especially for the beginning pupils, special attention was given to the facilities to be used by little folk; i.e., built-in lockers in each room and modern toilets, arranged so that they are particularly adaptable for small children. In case of emergency, three main entrances and a fire escape make rapid evacuation possible.

The three rooms for first-year pupils are located on the first floor. They are equipped with low tables and chairs instead of desks. This type of equipment is easily moved, thus facilitating the opportunity for games and other activities so essential for the proper development of pupils at this level. One of these rooms, equipped with a piano, is used when the three rooms assemble for special programs.

The second- and third-year rooms are also grouped in sections of three each. In these rooms the seats and desks are fastened to a four-inch wooden strip. This makes it possible to move the seats back and forth to provide space for additional innovations in the daily school program.

Each of the ten rooms has a seating capacity of from 25 to 30 pupils. All rooms have adequate auxiliary lighting systems. Linoleum floors in both the hallways and classrooms has reduced the care and maintenance to a minimum.

The building is heated by means of a convertible gas-coal heating unit, located in the basement and providing steam for the unit ventilators in each of the classrooms.

The building is fireproof in construction with concrete floors, using steel-form bases. The walls are of wire cut face brick, backed with hollow tile and common brick. The finish floors throughout are asphalt tile, with metal cove at the walls. The wainscoting in the classrooms, corridors, and toilets is glazed tile. The walls are of plaster and the ceilings have one-half inch insulation board in predecorated panels.

The classroom lighting represents an interesting experiment in the use of glass brick, flanked with projecting type steel windows of wire glass.

The roof is 25-year built-up material.

The toilets and plumbing fixtures are of heavy-duty type and the toilet partitions are of metal.

The Powell School

The Powell grade school, erected in 1940, for School District No. 1, in Park County, Wyo., is similar in construction and plan to the Riverton School. The building contains at present ten classrooms and is planned for an extension on either end to include a gymnasium-auditorium, a library, offices for the principal, and industrial-arts rooms.

The building is heated by means of a gas-fired boiler, supplying steam to a vacuum unit ventilator system.

[1]School Nurse, School District No. 25, Riverton, Wyo.
[2]Grade School Principal, School District No. 25, Riverton, Wyo.

THE AMERICAN
School Board Journal
A Monthly Periodical of School Administration
Edited by
Wm. Geo. Bruce and Wm. C. Bruce

SCHOOL BUILDING FOR 1945

WHILE the year 1944 has seen an almost complete cessation of school construction activity with a lamentable lag in the definite planning of new buildings, there has been some crystallization of thinking on basic planning by responsible school authorities. When the active formulation of educational needs and programs is completed after the end of the European phase of the war, it is certain that well matured statements of plant needs and desires will be available for translation into blueprints and actual construction.

The financing of school construction projects is a puzzle that cannot be solved without immediate consideration of local economic abilities and of probable changes in state and federal aid to public works. It is likely that numerous local school districts will be unable to finance adequately their postwar school-building needs. There are reasons for asking that the states assume a goodly share of the cost out of the vast surpluses built up during the war years. Communities which will be hit by the shift of their war industries to a peace basis will have need for such state aid. If then the federal government does its share in assisting the states and local school districts in its public works program for maintaining full employment, the needed relief will provide results valuable in themselves. It must be added that an encouraging aspect of the present situation is the growing financial strength of the better situated school districts. Remarkable reductions have been made in the debts of the city school systems; bonds have been paid off; advance building funds have been accumulating, and some courage has been shown in increased tax levies for later construction purposes.

School boards who are holding back in their planning because they expect very much lower building prices after the first rush for new housing and needed public buildings is over, are likely to be disappointed. Certainly they are overlooking the point that children cannot wait with their education but need proper teachers and school buildings when they are of educable age. Nor is there likely to be a big drop in costs after, say, five years. The very desirable war-time controls of wages and prices which have prevented inflation since 1941 will unquestionably be continued to prevent a run-away inflation or a collapse of wages such as harmed us so much during the twenties. The very gradual reduction in material and labor costs, if and when they come, will hardly justify long delays of needed buildings.

In the definite planning of postwar buildings there has been little progress. The problem of classroom plan has been solved only indifferently in spite of the improvement suggested by the new types of rooms developed in Southern California and in certain war-boom communities. If the mere lengthening of rooms for activity and group work permits city school systems to enlarge the class load of teachers, the advantages sought for the new teaching methods will be more than lost. The planning of school shops and home economics laboratories, except for some widely accepted ideas, is still chaotic and should perhaps remain fluid and without socalled standards, until there is more agreement concerning class organization, methods, courses taught, and jobs to be undertaken.

In the over-all arrangement of buildings, the departure from the formal balanced plan gives the best hope of better postwar buildings. The substitution of multi-wing, irregular floor layouts which are studied in each case for the best relation of departments, a minimum of pupil traffic and the avoidance of bottlenecks, and the relegation of little used and noise or odor-producing areas to the remote corners or wings — all give hope of more efficient buildings. Progress is, however, hardly possible unless some professional executive in the school system harmonizes the ideas of teaching groups and of the architect in behalf of the ultimate service and social values of the building to the community as well as the children.

In the newest wartime school buildings some progress has been made in adapting the so-called functional design to reasonably express the scholastic activities and civic purposes of schoolhouses. Too many of the modernistic buildings in Northern and Eastern cities, however, have been replicas of fine factories and plant offices, and have clashed in scale and treatment with the domestic architecture of the more modest neighborhoods. In contrast, the low, sprawling buildings in Southern California have been friendly and attractive and appropriate in their surroundings. The functional types of school design should soon reflect more maturity and logic and less seeking after novelty as their proponents gain experience and a more mature understanding.

The dedication of a school building or of a major room, e.g., an auditorium, as a memorial to the honored dead of the war is worthy of consideration by school boards.

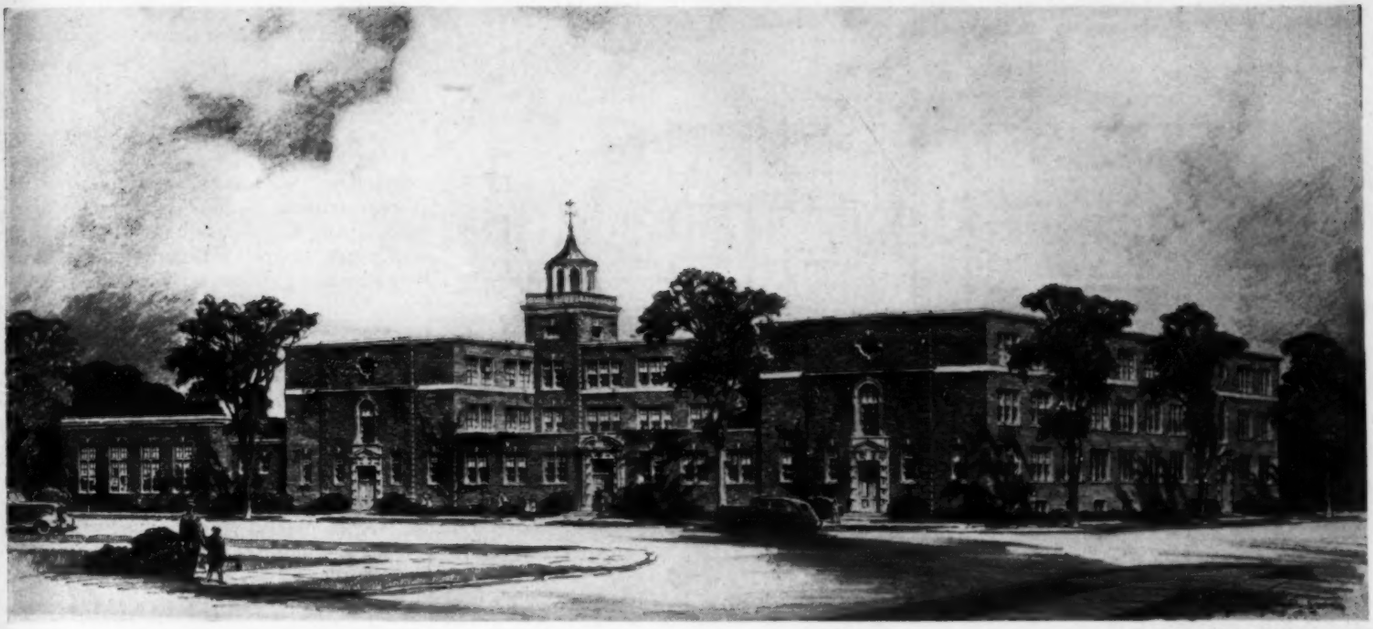
THE BOSTON SURVEY

THE findings of the Boston school survey have demonstrated once again the ill effects of muddled city school relations, of politics, and of failure to give due respect and attention to the respective duties of the professional executives and of the school committee.

While politics is blamed for most of Boston's administrative failures, the real trouble is traced back to confused legislation which has set up a maze of public bodies and officials all of whom are more or less independent and responsible to no one central authority. The survey blames no individual for the situation and in fact highly praises the executives in charge of both educational and business affairs. Above all, it makes clear the need for a hierarchy of supervisors and professional executives, centered under the superintendent of schools as chief executive, who in turn is responsible to a nonpolitical, policy-making school committee. Under carefully drawn legislation which withdraws the schools from municipal influence and control, except for certain ministerial services, the survey urges that the committee must act as an agent of the state and as the direct representative of the citizenship.

To a distant observer the Boston situation is evidence of the great importance of the school board and of the necessity of having it develop sound educational and administrative policies, select fully competent executives, and demand continuous and effective service on the part of its superintendent and his instructional and business subordinates.

It has been well said that the biggest job of a school board is to find a fully competent superintendent. It should be added that the other half of the job is to exercise eternal vigilance over the entire administration so that there may be steady growth in efficiency and due economy. No board can be complacent about its work or the work of its professional staff. A continuous review is necessary of the schools' achievements, of the organization as such, and of the processes and personnel of supervision and administration. It is essential to the success of any democratic school system that the administration be efficient only as a means to the educational ends of the school enterprise.



General Perspective, Public School No. 3, Brooklyn, New York.—Chapman, Studds & Evans, Architects, New York, New York.

One of the New York City Postwar School Buildings

N. L. Engelhardt[1]

New York City is a group of communities, and careful attention is being given to fitting the schools into the communities which they serve. The postwar school-building program of New York City includes the planning of elementary schools, junior high schools, and general and special vocational high schools.

Public School 3, Brooklyn, is planned as a neighborhood school for boys and girls from kindergarten to and including the 6B grade. Facilities will be made available to the community for general, recreational, civic, and social use. The gymnasium, the auditorium, the library, the visual instruction room, the lunchroom, the kitchen and teachers' lunchroom will be particularly adaptable to this general use.

In planning the school, an effort is being made to have it reflect the history of the locality. The architects, Chapman, Studds, and Evans, of New York City, have created a design to recall the Georgian architecture of pre-Revolutionary times when this district, originally the old English town of Bedford Corners, reached the height of its prosperity and cultural influence. The exterior will be of handmade oversized red brick with cornice, belt courses, trim, and doorways of light gray limestone. The details will be based on the traditional English architecture of the middle of the eighteenth century. The interior will be homelike and colorful and in its individual aspect will be a departure from the ordinary school building.

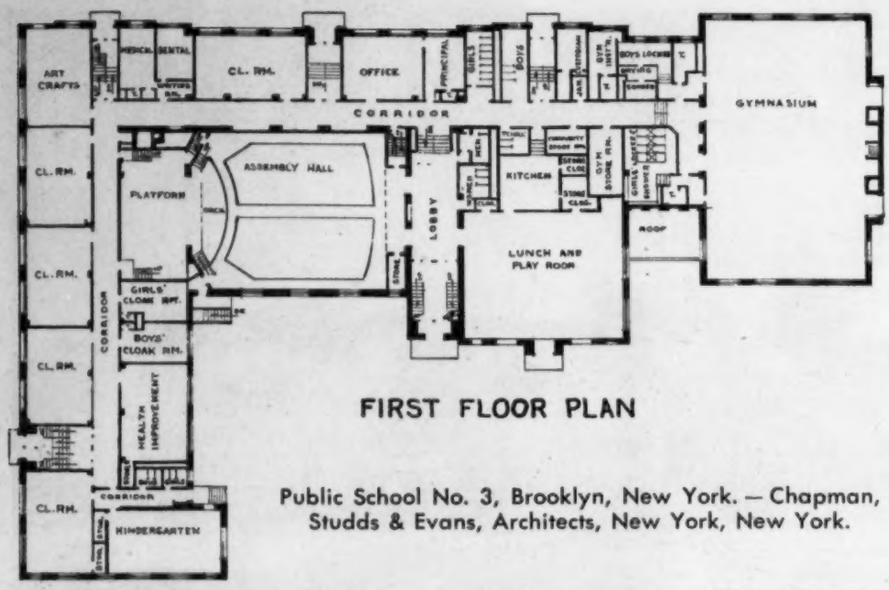
The facilities within the building will include forty classrooms, boys' and girls' gymnasiums, library, nature study, and arts and crafts room. There will also be a children's organization room for boys' and girls' clubs and provision for proper administration, and medical suites. The assembly room will seat four hundred. The lunchroom is also developed for play purposes.

Following the general trend in the postwar program, the building will not exceed three stories in height, and educational spaces have been kept out of the basement. Adjoining the school will be an extensive playground which will be jointly operated by the board of education and the New York City Department of Parks. This means that playground use will extend from early in the morning until late in the evening.

There has been a long history associated

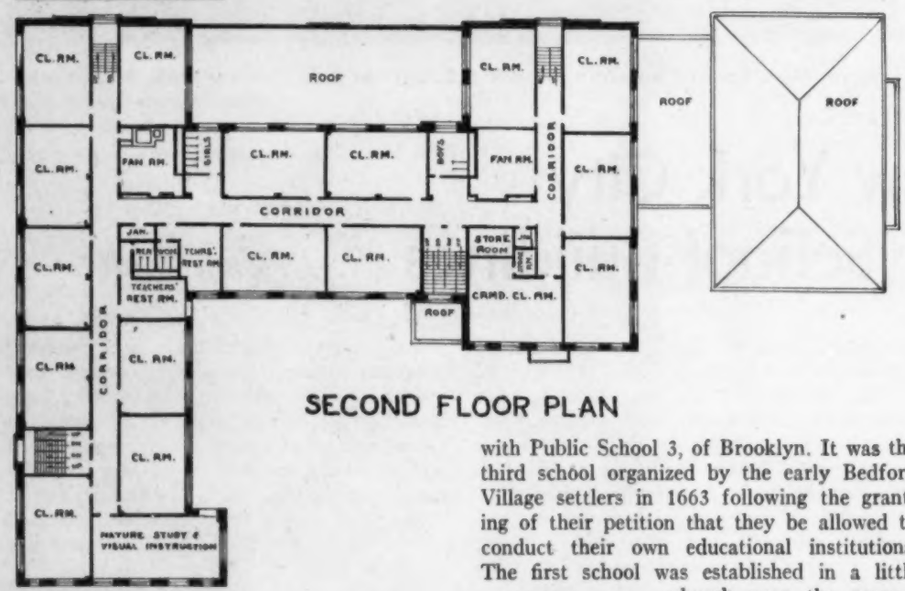
Public School No. 3, Brooklyn, New York. — Chapman, Studds & Evans, Architects, New York, New York.

[1]Associate Superintendent of Schools, Board of Education, of the city of New York.

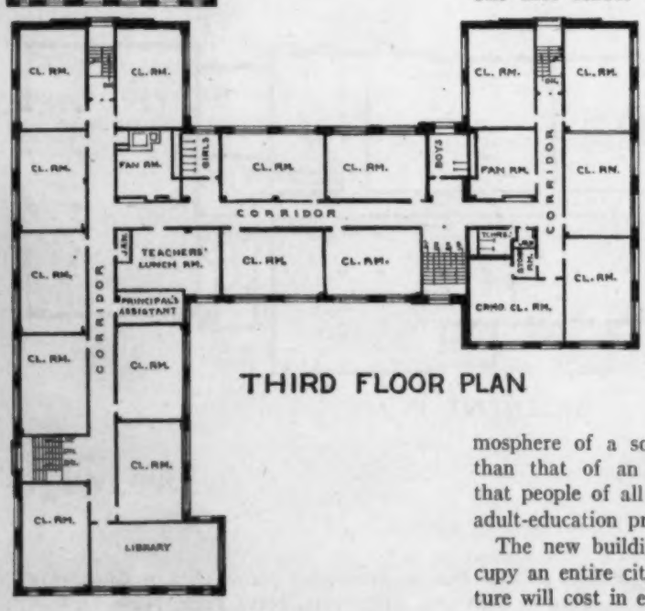


FIRST FLOOR PLAN

Public School No. 3, Brooklyn, New York. — Chapman, Studds & Evans, Architects, New York, New York.



SECOND FLOOR PLAN



THIRD FLOOR PLAN

with Public School 3, of Brooklyn. It was the third school organized by the early Bedford Village settlers in 1663 following the granting of their petition that they be allowed to conduct their own educational institutions. The first school was established in a little church near the present junction of Fulton and Bridge Streets, and the second was opened in the village of Bushwick. Of these three early schools, only Public School No. 3 exists today. The new proposed structure will link the past with the present. Although of Georgian architecture, a modern building has been planned that will adapt the school to its community and create an attractive informal atmosphere of a social gathering place rather than that of an institution. It is expected that people of all ages will participate in the adult-education program of the school.

The new building and playground will occupy an entire city block, and site and structure will cost in excess of one million dollars.

The New York City postwar school-planning program has been a part of a city-wide comprehensive postwar planning program under Mayor Fiorello H. La Guardia, and administered by the New York Post-War Planning Commission on which are included representatives of the various city departments. The results of the combined efforts of all organizations of the city to bring about a unified plan may be seen in a postwar exhibit which Mayor La Guardia and the Post-War Planning Commission have set up at 500 Park Avenue, which is the board of education's old headquarters building in Manhattan. Here may be seen parks and bridges, school buildings and college buildings, highways and disposal plants, large-scale housing and governmental buildings, in one all-embracing scheme for the betterment of our largest city.

A review of this exhibit will show that the schools are playing an exceedingly important part in this vast postwar program.

A POLICY ON NAMING SCHOOLS

It has been the practice in this country to name schoolhouses after outstanding persons in American history. There has, however, also been a tendency to honor local characters who have rendered distinctive service to the cause of popular education. Thus, for instance, schoolhouses were named after teachers who served faithfully for a half century or more or after some self-sacrificing superintendent, principal, or member of a board of education.

A controversial situation is likely to arise where a change of name is in contemplation, more especially when the names of those considered are local characters. The rule has been to ignore living persons and to honor only those who have passed beyond.

The city of New York has in contemplation a series of new school buildings and the board of education has considered the question of naming them. It is believed that a definite policy or formula should be adhered to and serve as a guide in the choosing of names. The conclusions reached are:

General academic high schools will be named after Presidents or leading American statesmen.

Special academic high schools will be named after leading exponents of the areas being served by the instructional program.

General vocational high schools will be named after leaders in industry, commerce, or labor.

Special vocational high schools will be named after leading exponents of the areas served by the instructional program.

Junior high schools will be named after outstanding figures of literature or the fine arts, invention, science, or discovery.

Elementary schools will be named after men and women who have contributed significantly to the development of the city.

The plan here presented contemplates more than elementary and high schools but also the buildings devoted to vocational studies. It aims at fitness and appropriateness.

It remains to be said that in choosing a name for a new school structure the lesson implied should be borne in mind. The example set in the life's career of the person whose name is honored must serve as an inspiration to the minds and hearts of the children who occupy the building.

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School Administration News

GUIDANCE AND PLACEMENT WORK IN AUSTIN

During the school year 1943–44 a guidance and placement program was conducted in the senior high school at Austin, Minn. Hundreds of students came to the co-ordinator's office seeking jobs, and many calls were received for students to fill part-time jobs. During the year all senior students were placed, with the exception of a few who were going to college in the fall. Few, if any boys over 16, were without work for the summer months.

Among the objectives of the part-time work program were the following:

1. To give students practical experience in trade and industrial work under school supervision, to supplement classroom work
2. To provide an opportunity for the student to apply his school training to real job situations while still in school
3. To provide a method for the school to check its instruction against industrial practice
4. To provide an opportunity for a student to secure expert help from the school in the solution of his special problems
5. To create a desire for work and to develop good working habits
6. To encourage thrift and the wise use of wages earned
7. To provide a wider range of training experience than would be possible if the training were given within the school

CHECKING PUPILS WHO LEAVE SCHOOL

The administrative department of the public schools of Barrington, R. I., during the school year 1943–44, initiated a checkup on pupils who had withdrawn from school, or who were about to do so. In some cases, the superintendent accompanied the attendance officer in visiting pupils who had been absent for a number of days and who had not returned to school. Not all efforts to have these pupils returned were successful, while many factors were found entering into the problem, the chief difficulty was in the weakness of parents who gave in to the wishes of their children to leave school, and get a job. In a few cases economic conditions entered into the problem. Some valuable cooperation was given by men teachers in the high school who took a personal interest in some of the boys.

In September, a checkup was made in the high school to determine how many pupils had been lost during the summer to private schools and how many had come back to the high school from private schools. It was felt that many of the influences brought to bear upon these young people could not be controlled by the school officials, and that it was really a problem demanding community-wide attention.

OFFER COURSE IN DISTRIBUTIVE OCCUPATIONS

Part-time cooperative classes are being operated in the Technical High School at Erie, Pa., in which twelfth-grade pupils are offered retailing instruction 15 hours per week in school and 15 hours of practical training in local stores, under the direct supervision of the schools.

The practice of excusing high school pupils from school attendance to work in stores during the Christmas shopping season was continued this year. A number of new policies have been adopted to provide the most effective help possible and to keep the practices on a uniform basis.

During the school year 1943–44 the schools cooperated with the Training-Within-Industry Division of the War Manpower Commission in furnishing to local industries three different short courses for industrial supervisors. Each course was ten hours in length and consisted of five sessions of two hours each.

TESTING CHILDREN FOR PROPER GRADING

The public schools of Eveleth, Minn., during the school year 1943–44, have been conducting a testing program to discover the needs of individual children. A trained psychologist is employed who spends considerable time in testing children to discover their needs and capacities.

Lack of achievement may be due to various causes, such as defective vision, poor hearing, improper methods of study, lack of interest, or poor native ability. Cases of retardation are studied and proper adjustments made. Each year there are some children who fall below the school entrance age by several weeks. Where the parents make a request, a mental test is administered. The results of the test are used as the basis on which to determine the advisability of early entrance in school.

The testing program has contributed greatly to the solution of problems concerning the grading of pupils, grouping of children, promotional plans, and an instructional program for retarded and gifted children.

GREENSBORO OFFERS EXTENDED SCHOOL SERVICE

The city schools of Greensboro, N. C., are conducting the largest extended school service program in the southeast. Under the program, the children of working mothers are taken care of in 16 child-care centers. Eleven of these are maintained for children of preschool age, and five for children of in-school age. Care is provided for children from 7 in the morning until 6 in the evening. Morning and afternoon snacks are provided and a full, well-balanced lunch is available at noon.

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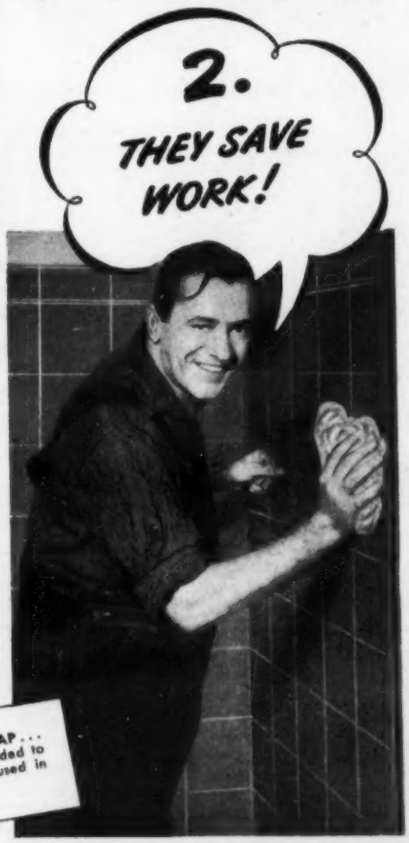

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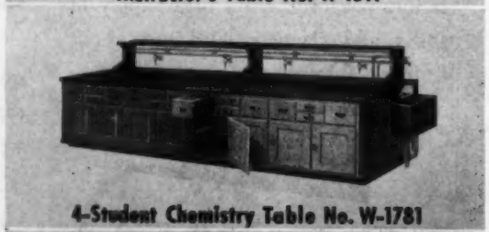
Instructor's Table No. W-1511



4-Student Chemistry Table No. W-1781

Wall Case No. W-425

Kewaunee LABORATORY FURNITURE

NEW REPORT CARD AT PENN YAN, NEW YORK

The teachers of the public schools of Penn Yan, N. Y., recently completed a study of report forms used in other schools which has resulted in the preparation of a new report blank.

The new form is a four-page folder, printed on heavy bond paper. The first page carries the child's name, grade, teacher, and a message of explanation to parents.

The second page contains an explanation of the marking system used. Achievement marks are in numerals, 1 meaning excellent progress; 2 meaning normal progress; 3 meaning slow progress, below average for age and grade.

Effort marks are letters, E meaning the child is making commendable effort; S means satisfactory, or good effort; U means unsatisfactory, with marked improvement needed. A further feature of the card is a complete report to the parents of the child's place in school citizenship, named as effort and achievement. The reports are issued quarterly, with special reports at more frequent intervals when the teacher deems it advisable.

NEW COURSES IN ERIE, PENNSYLVANIA

During the school year 1943–44, a number of new classes were organized in the public schools of Erie, Pa. Classes for hard-of-hearing, bedfast crippled, and speech correction were established. Individual instruction was provided for homebound pupils and child-care centers were conducted in two schools.

In addition, vocational home-economics courses for girls, and preflight aeronautics courses for boys were offered in the senior high schools. Courses in home care of the sick were carried on in four schools.

A guidance program begun five years ago has become an effective part of the school system. Each high school schedules a one-half hour period each week for a planned guidance period. Guidance lessons for each week are written for all secondary grades from 7–1 to 12–2.

Extracurricular periods in both elementary and secondary schools are encouraged and provisions are made for their development under adequate supervision, with emphasis on those aspects necessary for the winning of the war.

The health program includes annual medical examinations of all pupils, together with nurse service, first aid, dental clinics, audiometer testing, and provision for refractions. A dental clinic is conducted two days each week in the junior high school. High school seniors are required to take the standard 20-hour Red-Cross first-aid course before graduation. Physical fitness courses are conducted in all high schools for boys and girls in grades ten to twelve.

The museum offers a film and slide library with modest provisions for expanding the available supply of materials and equipment.

FEDERAL ASSISTANCE INCREASES SCOPE OF LUNCH PROGRAM

A continuing demand by local sponsors for federal assistance for community school lunches has increased the number of children participating in the feeding program in 11 midwestern states to 1,294,000, according to Mr. E. O. Pollock, Midwest Regional Director of the WFA.

The community lunch program is now in operation in 7949 urban and rural schools in 11 states. Participation in the program on November 11 had increased nearly one half million children over October 15. At the same time, 15,852 children are being served with a nutritious lunch daily, in feeding programs operated by 145 child-care centers in the 11 states comprising the midwest area. The Federal Government reimburses local sponsors for part of the cost of serving on the basis of the type of lunch served. Sponsors are permitted to purchase foods from local stores or producers, and the Federal Government supplies food free of cost from stocks acquired through price support programs. Congress has appropriated 50 million dollars to provide assistance during 1944–46 to sponsors of these programs.

ELGIN CONDUCTS IN-SERVICE PROGRAM

The high school faculty of Elgin, Ill., under the direction of R. S. Cartwright, principal of the school, held an in-service education program during a two-day period on Friday and Saturday, September 1 and 2, 1944. The teachers came back to school two days earlier in order to attend the institute. They also assessed themselves $3 each with which to pay for the services of two outstanding experts.

The program was divided into sections, with a student panel, a parent panel, and a teacher panel, arranged to direct the thinking of the particular groups. The students offered many fine suggestions for the betterment of the school, as did the parents. The meeting with the parents was open to all the parents of the students. The meeting, which was well attended, was commended as one of the finest public-relations projects sponsored. At the last session, an hour was set aside to crystallize the thinking on the various suggestions and to offer opportunities for definite conclusions.

The attendance of the faculty was entirely voluntary and represented approximately 100 per cent of those who could possibly be present. All those in attendance were agreed that they received more benefit and that better understanding and faculty morale was created at this meeting than at any other educational conference held in the past.

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KANSAS CITY POSTWAR PLANNING

Nate W. Downes[1]

The Division of Buildings and Grounds of the School District of Kansas City, Mo., in its planning for postwar school-building construction and remodeling has placed especial emphasis on the study of the needs of the elementary schoolroom to the end that a plan may result that will adequately and effectively meet the needs of a modern educational program.

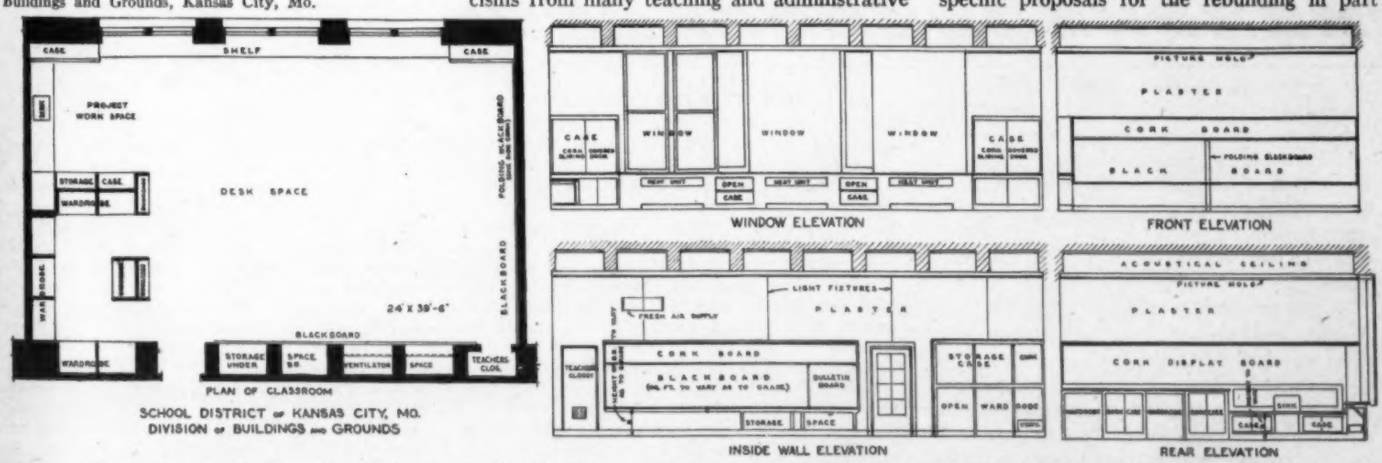
This study has taken the form of a request to the Advisory Committee of Elementary School Principals to select a committee from the elementary teaching, administrative, and supervisory staffs to work with the Division of Buildings and Grounds in making a study to the end that specific recommendations may result covering size, arrangement, appointments, equipment, and environment.

To give the committee something tangible to start with and from, the Division of Buildings and Grounds has prepared a sketch of such an elementary schoolroom based on an interpretation of the trend, gleaned from observation together with suggestions and criticisms from many teaching and administrative associates. These local data have been supplemented by information gained from articles written by school authorities in the current school publications and from studies appearing in architectural publications during the past two years.

The sketch anticipates a room 24 feet wide and 40 feet in length, containing facilities for children's wraps, an open work shop with stainless steel sink provided with hot and cold water, and the utilization of all space to the best advantage for closets, books, storage, etc.

A general study of plans for the postwar period has resulted in a brochure setting forth specific proposals for the rebuilding in part

[1]Assistant Superintendent of Schools in Charge of Buildings and Grounds, Kansas City, Mo.



Floor plan and elevations of a typical elementary classroom under study in the Kansas City, Missouri, schools.

It's a good thing this young man made his mistake on the blackboard!

Ever since the very first arithmetic class, we imagine, there have been youngsters who when dividing fractions have failed to invert their divisors . . . and as long as pupils are prone to make this and other mistakes in method, it's best that they make them on the blackboard, for one of the blackboard's basic uses is TO REVEAL PUPIL DIFFICULTIES WHICH WOULD NOT BE SO READILY EVIDENT FROM THEIR SEATWORK.

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or *in toto* of 19 old, obsolete, nonfireproof elementary school plants on enlarged sites where necessary, with consideration for making available to the community, facilities for recreation, social and civic activities.

Fundamental features in the planning of such buildings are:

1. To be planned on a purely functional basis

2. To be not in excess of two stories in height, and without basement rooms other than required for utilities

3. Provision to be made for segregating of large units such as cafeteria, auditorium, and gymnasium so that these areas may be used for community and extracurricular purposes, independent of the rest of the building.

EDUCATION FOR CITIZENSHIP

A five-year experiment in education for citizenship will be initiated in Detroit, Mich., very soon, following the acceptance by the board of education of a grant of $425,000 from the William Volker Charities Fund, Inc., of Kansas City.

The experiment, which is to be conducted by Wayne University and the Detroit public schools contemplates a study of ways of increasing interest, competence, and participation of boys and girls in the activities of the good citizen and to develop them eventually into good adult citizens.

An outline of the project, prepared by the University and the public schools, indicates that the study was prompted by the existence of a great need for raising the level of civic life in America. The plans call for an initial inventory of the present interest of boys and girls in citizenship activities, to get as complete a picture as possible of the schools and communities to understand thoroughly the environment in which the pupils live. This will be followed by controlled experimentation with old and new citizenship training techniques.

The investigation will be carried on by a special staff which will operate in six city schools, including two elementary, two intermediate, and two high schools.

PROGRESS AT SWEETWATER, TENNESSEE

The public schools of Sweetwater, Tenn., are the possessors of a new elementary school auditorium, with a 1000-seating capacity. Plans are being made for the erection of a school gymnasium and for the establishment of a physical-education program.

During the postwar period it is planned to install adequate intercommunication telephone systems and to improve and extend the visual-education program.

The public schools have participated in all of the war drives and have exceeded their quota from 600 to 2700 per cent.

During the school year 1943–44, the schools participated in a black walnut cooperative sale for elementary students. The sales ran from 63 cents to $47.81. A similar sale, conducted in December, 1944, produced an aggregate sale of $1,500, which provided Christmas money for the pupil participants.

SUMTER POSTWAR PROGRAM

The board of education of Sumter, S. C., has prepared a postwar program which will involve the organization of a twelfth grade. The addition follows a study which has resulted in a revision of the high school curriculum and which has stimulated considerable professional investigation and study of the high school curriculum in South Carolina. The study was carried out by a group of forty professional men at the University of South Carolina last summer directed by Dr. J. McT. Daniel.

During the past summer, a cannery was built at the high school and served over 500 families. A total of 30,000 cans of produce were saved by the canning project and put to home use. Some of the patrons used the cannery to prepare chicken to send to the war veterans overseas.

FEDERAL AID TO POSTWAR PLANNING

Major General Philip B. Fleming, administrator of the Federal Works Agency in Washington, speaking recently on federal aid to postwar planning, at a meeting of the New Jersey League of Municipalities in New York City, endeavored to point out the necessity of stimulating public planning, and especially postwar planning by states and municipalities.

Major Fleming emphasized that it would be necessary to give priority to those projects which are most urgently needed, which can be put into operation quickly, and for which financing has been arranged or is in sight. Attention will be given to those projects which will make the greatest contribution to community welfare and health. This means that it will be the aim to help in planning a needed sewer system, a water works system, or a hospital rather than a monumental structure.

The public works construction program throughout the nation, he said, must be so planned that, if necessary, it can rise above five billion dollars in the first year of peace. It appears that state and federal-aid highway work will account for a billion dollars' worth of this. Approximately three and a half billion dollars' worth of work will be used by states, counties, cities, and special districts in carrying on their projects.

Figures were given by Major Fleming showing the planning work already completed in New Jersey. The survey shows that the state government has completed plans for 22 projects to cost three million dollars, 13 counties have completed plans for 39 projects to cost four million, and the cities have completed plans for 300 million dollars' worth of projects.

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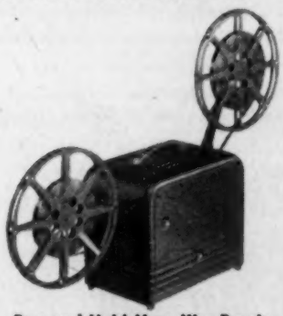

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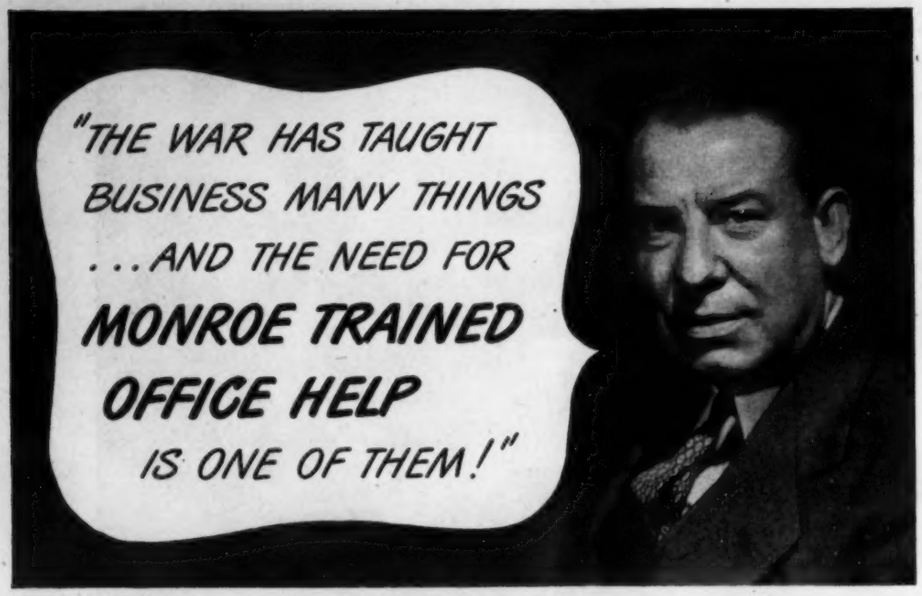

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School Law

Schools and School Districts

The fact that ballots cast at a school district organization election do not conform to the statute does not prevent a validation of districts by curative act.—*People ex rel. Reich* v. *McCoy,* 56 Northeastern reporter 2d 393, Ill.

An independent school district in its corporate capacity has no vested right in respect to territorial boundaries as originally established, and the Texas legislature has authority to change the boundaries at will and to provide the mode and agencies by which such change shall be effected. Vernon's annotated civil statutes, arts. 2742e, 2742f.—*City of Beaumont Independent School Dist.* v. *Broadus,* 182 Southwestern reporter 2d 406, Tex. Civ. App.

The Illinois legislature may organize a school district without a petition therefor.—*People ex rel. Reich* v. *McCoy,* 56 Northeastern reporter 2d 393, Ill.

A school district created by the Illinois legislature must be compact in order to comply with the constitutional requirement of an efficient school system. Smith-Hurd stats. constitution, art. 8, § 1.—*People ex rel. Reich* v. *McCoy,* 56 Northeastern reporter 2d 393, Ill.

School District Government

Members of county boards of public instruction in Florida are statutory officers, and vacancies in membership are to be filled by the governor. F.S.A. §§ 230.04 *et seq.,* 230.08 *et seq.,* 230–19.—*Advisory Opinion to Governor,* 19 Southern reporter 2d 198, Fla.

The Florida statutes pertaining to members of county boards of public instruction provide a complete scheme for nominating, electing, and filling vacancies in such boards, and it was competent for the legislature to so provide. F.S.A. §§ 230.04 *et seq.,* 230.08 *et seq.,* 230.19.—*Advisory Opinion to the Governor,* 19 Southern reporter 2d 198, Fla.

The failure of the 1941 act pertaining to the nonpartisan election of members of county boards of education to mention a former act disclosed a legislative intent to make no change in the method of nomination notwithstanding that there existed laws providing for election on a nonpartisan ballot and authorizing nomination of partisan candidates for such office. W. Va. code of 1931, 3–4–5 as amended by the acts of 1939, c. 57; code of 1931, 3–4–22a, as added, and 18–5–1, as amended by the acts of 1941, c. 42.—*State ex rel. Thomas* v. *Board of Ballot Commissioners of Kanawha County,* 31 Southeastern reporter 2d 328, W. Va.

School District Property

The practice of the board of education of the city of New York in employing for each building a custodian and permitting such employee in turn personally to hire and discharge at will all matrons, firemen, and other custodial and janitorial help required to operate and maintain such building, and in paying such custodians lump sums from which they pay their employees and retain the balance for their own profit, is violative of a constitutional provision pertaining to civil service. N. Y. constitution, art. 5, § 6—*Beck* v. *Board of Education of City of New York,* 50 N.Y.S. 2d 19, N.Y.Sup.

Where a Texas enlarged school district planned to preserve and protect the best interests of enlarged district and interest of all patrons by selling property previously belonging to the annexed district, on the ground that the property was standing idle and deteriorating, but did not intend to divert or misuse the property, the district had the authority to sell the property. Vernon's annotated civil statutes, arts. 2753, 2754, 2767d, 2922k.—*Weaver* v. *Board of Trustees of Wilson Independent School Dist.,* 182 Southwestern reporter 2d 140, Tex. Civ. App.

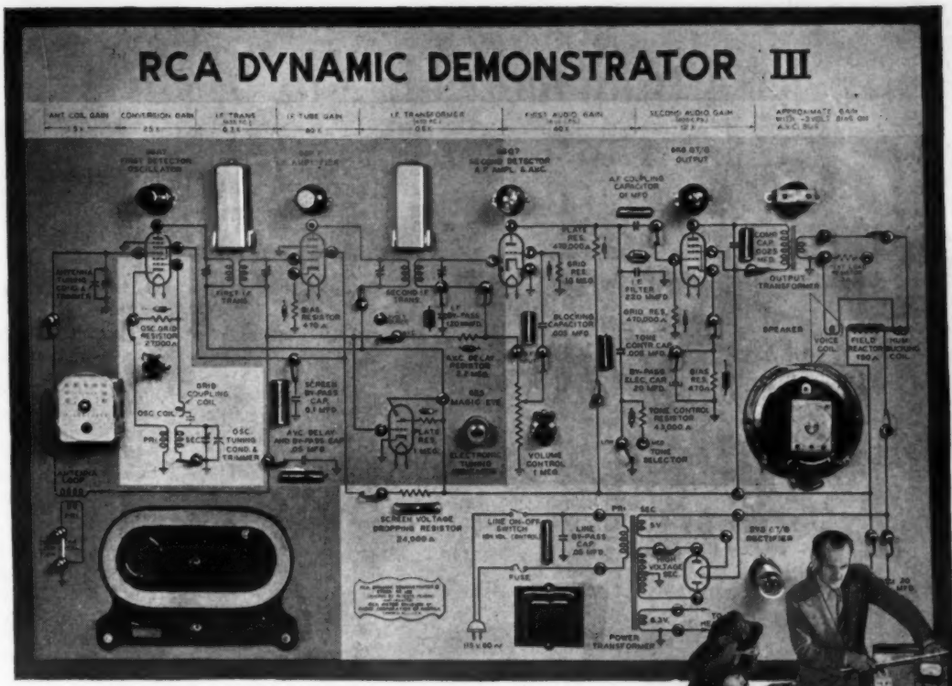
School District Claims

Under an Oklahoma law it is the duty of a school district to exercise extraordinary care for the safety of children being transported to and from school.—*Earl W. Baker & Co.* v. *Lagaly,* 144 F. 2d 344, C.C.A.Okla.

Evidence that the driver of a school bus knew, or should have known, that a truck was following the bus, and without ascertaining the proximity of the truck or warning the children of the approach of the truck, stopped the bus and permitted the children to alight, knowing that they would immediately start to cross the highway in order to reach their homes, authorized the jury in finding that the driver was negligent, and that such negligence was a proximate cause of the death of the child who was struck by the truck, which finding warranted the judgment against the insurer of the school bus. 70 O.S. 1941, § 11951.—*Earl W. Baker & Co.* v. Lagaly, 144 F. 2nd 344, C.C.A. Okla.

That a teacher's per diem service was frequent and was continued from year to year did not serve to invest her with any rights as a permanent employee. New York Education Law, 881, subds. 2–a, 3.—*Lee* v. *Board of Education of City of New York,* 50 N.Y.S. 2d 86, N.Y.Sup.

The Massachusetts constitutional provisions providing for the support of "common schools" do not require the commonwealth to furnish free education in state teachers colleges, since "common schools" or "public schools" embrace only the grade schools and high schools. Constitution, pt. 2, c. 5, § 2, and amended arts. 18,46.—*Lynch* v. *Commissioner of Education,* 56 Northeastern reporter 2d 896, Mass.



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Teachers' Salaries

NEW PLEASANTVILLE SALARY SCHEDULE

The board of education of Pleasantville, N. J., has approved a new salary schedule prepared under the direction of Mr. Simon H. Horstick, superintendent of schools.

The minimum salary for beginning teachers will be $1,500. Teachers with two years' preparation after high school will be given increases of $30, to be given in ten installments up to a maximum of $1,800. Teachers with three years' preparation will be given increases of $40, to be given in ten equal installments up to a maximum of $1,900.

Teachers with four years' preparation and a bachelor's degree will be given increases of $50, to be given in ten installments up to a maximum of $2,000. Teachers with a master's degree or a supervisor's certificate will be given increases of $70, to be given in ten installments up to a maximum of $2,200.

The schedule provides a minimum of $2,000 for elementary principals, with increments of $100 up to a maximum of $2,700. High school principals will be given increments of $100 up to a maximum of $3,500.

All new teachers must be graduates of a four-year college. New teachers will start at $1,500 but after two years of successful teaching, they may receive the annual increments until the maximum for the group is reached.

All teachers are divided into four groups, according to professional preparation. Teachers may advance from one group to another by the presentation of evidence of 32 credits acquired by advanced professional training approved by the superintendent.

In order to effect an equalization in terms of service rendered and to recognize successful experience it is provided (1) that teachers with one to five years' may advance one step in the schedule; (2) teachers with five to ten years' service may advance two steps in the schedule; teachers with ten to fifteen years' service may advance three steps in the schedule.

ADOPT REVISED SALARY SCHEDULE AT SOMERVILLE, MASSACHUSETTS

The school board of Somerville, Mass., has adopted a revised salary schedule, which will become effective January 1, 1945. The schedule was revised by increasing the maximum for elementary teachers so that the differential between the maximums of the previous schedule of elementary and junior high school teachers will be retained. The maximum of the supervisors of penmanship, Americanization, and art was increased to $2,350. Elementary teachers will begin at a minimum of $1,500 and will be given increases of $100, up to a maximum of $2,050. Junior high school teachers will start at $1,550 and advance at the rate of $100 per year up to a maximum of $2,250. Senior high school teachers will begin at $1,550 and advance at the rate of $100 per year up to a maximum of $2,300. Heads of departments will begin at $2,150 and advance at the rate of $100 per year up to a maximum of $2,400.

NEW SALARY SCHEDULE AT HAMILTON

The school board at Hamilton, Ohio, has adopted a new single-salary schedule for teachers which went into effect in July, 1944. The schedule was developed by the classroom teachers' committee, working with the board in carrying out the project.

The schedule provides for a minimum salary of $1,200 for inexperienced regular teachers, with regular annual increments of $100 up to a maximum of $2,720. New salary schedules were also adopted for building department employees, clerical workers, lunchroom workers, and medical employees.

TEACHERS' SALARIES

► The city schools of Greensboro, N. C., are maintaining an equalized educational program, which provides equal salaries for teachers of equal training and experience, as applied to Negro and white teachers. Under the program, it not only provides equal salaries for equal qualifications, but through biracial organization it provides equal opportunities for the employment of Negro teachers.

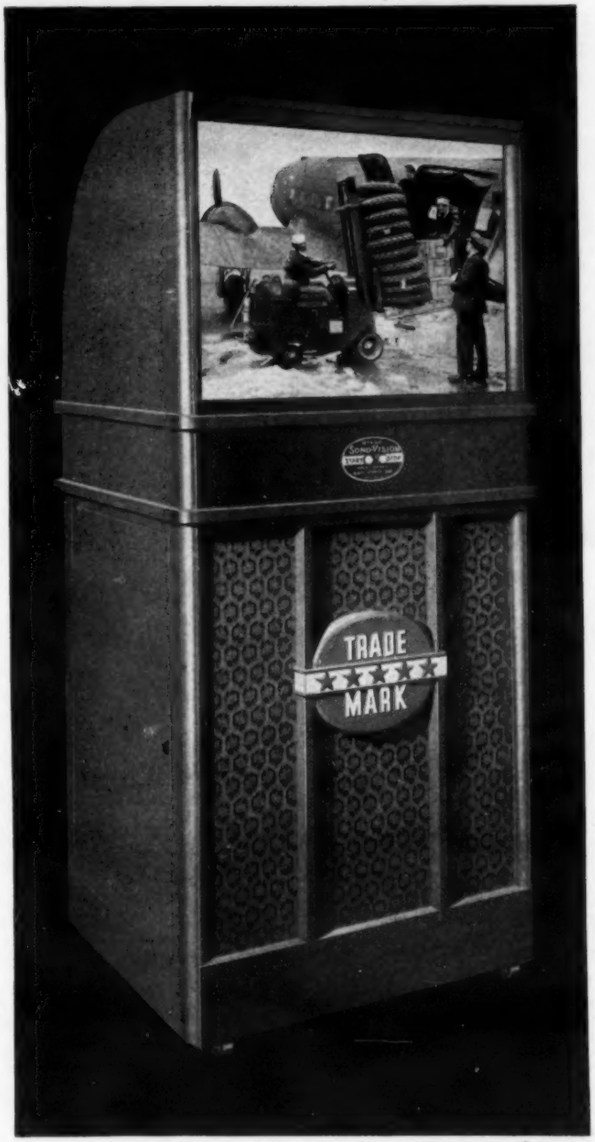
► Tacoma, Wash. Wartime emergency salary increases of $510 per year for each of the 900 school employees have been approved by the school board for the year 1945–46. The increases have been made possible by action of the voters in approving an eight-mill tax levy.

► The 1944–45 budget of the school board of Erie, Pa., provides for a continuance of the special temporary increase of $100 for all employees. The state increments will also be continued for the new school year. The annual salary of each employee is determined by adding the special state and local increases to the base salary according to a definite schedule arranged by the board of education.

► New Bedford, Mass. The school board has made provision in the 1945 school budget for 10 per cent salary increases for all school employees. The increases are intended to offset the increased cost of living.

► Brockton, Mass. The school board has voted to give increases of $100 to all teachers and other employees for the year 1945.

► Onalaska, Wis. The school board has voted to pay $5 per day to substitute teachers in high and grade schools.



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School Finance and Taxation

MOLINE APPROVES TAX REFERENDUM TO INCREASE TAX RATE

The voters at Moline, Ill., on October 7, approved a tax referendum measure to increase the tax rate from $2.625 to $3.375 for the purpose of financing a new single-salary schedule for teachers.

SEATTLE SCHOOL TAX LEVY APPROVED BY VOTERS

The special school tax levy for the public schools of Seattle, Wash., was approved by a decisive vote of the voters on November 7.

The success of the project was largely due to the enthusiastic support given by the entire school district. Local parent-teacher groups, service clubs, and the chamber of commerce were most helpful in spreading information with regard to the levy.

It was a matter of great satisfaction that the majority of the people of Seattle are in favor of the best facilities for their schools.

HOUSTON SCHOOL BONDS APPROVED

At an election held on November 7, the voters of Houston, Tex., approved 30-year serial bonds amounting to a total of $7,500,000. The bonds which are dated February 1, 1975, will mature at the rate of $250,000 each year through February 1, 1975. The bonds were voted at a rate of interest of not to exceed 2½ per cent.

The proceeds of the bonds will be used for the renovation and remodeling of the existing school buildings and for the purchase of sites and the construction of new buildings.

POSTWAR PLANNING PROGRAM IN PERRYSBURG

The board of education of Perrysburg, Ohio, with the assistance of Supt. E. D. Jarvis, has outlined a postwar planning program, to be started with the close of the war.

Plans are being made for the establishment of a six-year high school. This will involve an addition to the present high school, planned some years ago but delayed because of the war.

Plans are also being made for the erection of one or more elementary schools. There is also a need for athletic field accommodations.

TUCSON WILL ERECT NEW SCHOOL BUILDINGS

The board of education at Tucson, Ariz., has obtained a grant of $209,024 from the Federal Works Agency, which will be matched by a school fund of $87,000, for the construction of a six-room school and additions to present school buildings.

The additions include six-room additions to two schools, a four-room addition to another school, and a seven-room addition to another school.

The board has completed additions to the high school cafeteria, at a cost of $22,000. The completion of this project has improved the outdoor service and kitchen from a functional standpoint.

Plans are being completed for the Jefferson Park School and for additions to other schools which will be ready for construction very shortly. Work has been started on plans for a Vocational High School and additions to the high school. General renovation, landscaping for school grounds and play areas, and additional surfaced courts for all schools are planned. The total project is expected to reach a million and a half dollars.

GREENSBORO BUILDING PROGRAM

A pay-as-you-go plan has been inaugurated in Guilford County, N. C., to take care of the building needs in rural Guilford, Greensboro city schools, and the High Point city schools. Appropriations were made in 1943 and 1944, even though the building ban exists. The appropriations will be continued from year to year to take care of the building requirements. It is believed that the reserve fund will obviate future bond issues.

MOLINE ADOPTS SINGLE-SALARY SCHEDULE

The board of education of Moline, Ill., has adopted a new single-salary schedule, which allows a minimum salary of $1,200 for teachers with no experience, and two years of college training. The maximum of $2,600 will be paid to teachers with eighteen years' experience and a Master's degree. The schedule will go into effect in September, 1945.

FINAL STRAYER RECOMMENDATIONS

Dr. George D. Strayer, director of the recent school survey, Boston, Mass., in his final report, has declared that the method of electing members of the school board has failed to give the city a satisfactory school board. He has proposed a new law providing for the appointment of members by the mayor from a list of candidates nominated by an ex-officio board of representative citizens.

He also has urged that the board of commissioners of school buildings be abolished and their functions and employees transferred to the jurisdiction of the school board under the administration of the superintendent.

He has recommended that the board of superintendents be changed from an administrative body to an advisory and quasi-judicial body, and that its membership be increased by the addition of a business manager as assistant superintendent. The duties of the secretary would be changed to become a recording secretary only of the board.

FINANCE AND TAXATION

► Tacoma, Wash. The voters of the school district have approved a $2,000,000 bond issue for proposed new buildings and additions, a ten-mill levy to raise $600,000 for repairs and maintenance, and an eight-mill levy for wartime salaries and operating expenses in 1945–46.

Big Business Wishes to Expand Educational Opportunities

Herbert B. Mulford[1]

Organized business and organized industry wish to help education. That is, businessmen organized in chambers of commerce, and industrialists organized in manufacturers' associations, are unequivocally expressing faith in expanded education as a factor which must be relied upon to accomplish more in the near future even than it has in the past. Two current events throw the spotlight on this stream of cooperative endeavor now definitely putting an impress upon public opinion as it influences the public schools of the country.

1. In November the board of directors of the Chamber of Commerce of the United States approved plans, under discussion for many months, to conduct a campaign of information through all the chambers of the country to enlighten businessmen on what good educational support and facilities mean to good business. The story of this program will be released for publication in the near future. The message is to the effect that business improves pretty much on the ratio of improvement of education. Previews of the charts supporting this argument indicate that, as a practical matter, money invested in school taxes is akin to capital well invested in business enterprise — that where we have the best developed public schools, the best financial support, and the best attendance of pupils, we find the highest scales of living, the largest retail sales of consumer goods, and the best employment in normal peacetime. This view is held not to be inconsistent with the well-known fact that well-to-do parents provide the best support for the local schools.

2. Strikingly comparable to this projected campaign is the one long under way by industrialists, under the guidance of the National Association of Manufacturers, for the same general purpose of bringing about an intelligent understanding between industry and education. Some 200 joint meetings of interested representatives in the several fields have been held in many states, the latest and most typical of which, perhaps, was that held in Chicago on November 30. While definitely initiated and guided by the National Association of Manufacturers, the direct participants were from three Illinois Associations — the Illinois Manufacturers' Association, the Illinois Association of School Boards, and the Illinois Education Association.

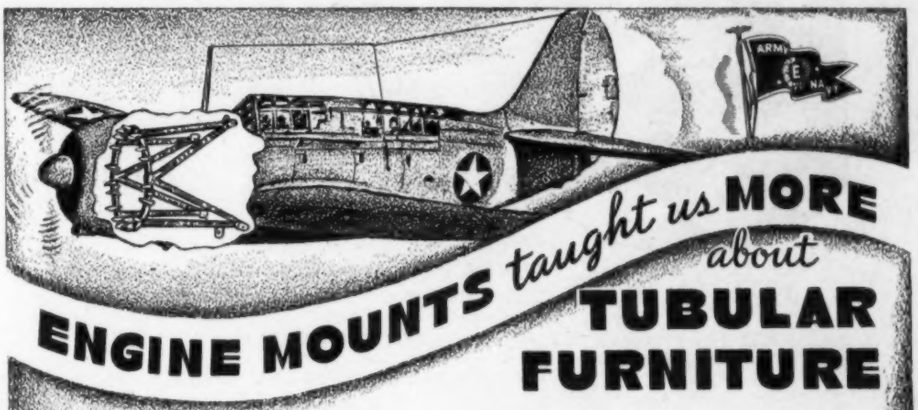
The general topics discussed at this conference were "Education and Better Living" and "Present and Post-war Problems in Education." The discussions followed the usual pattern of several addresses by state leaders from the several associations.

Agreement Emphasized

Since school-board members usually are elected from laymen and not from the profession, it is apparent that many of the school-board representatives came out of the ranks of business and industry. Thus these men spoke, in a sense, from experience on both sides of the fence which has long been supposed to separate all business interests from those of education. This division today is held by many radical leaders among organized teaching groups to regulate their salaries adversely, to prevent the teaching of many subjects in the schools, and to be a drag on certain aspects of democracy. The striking thing about the Chicago conference was a complete absence of discord, a complete ignoring of the verbal and cartoon brickbats hurled at industrialists by the CIO political action committee, and an almost complete unanimity of working principles by all the discussants. Not unnaturally there were numerous differences of opinion as to ways and means to overcome present great obstacles to educational advancement in the United States. But the keynote of the meeting was the emphasis on agreement.

Two matters of minor consideration are deliberately selected here for emphasis above the speeches and the hope that further conferences will be held all over the state. These are the very obvious lack of a clear picture of educational

[1]Wilmette, Ill.



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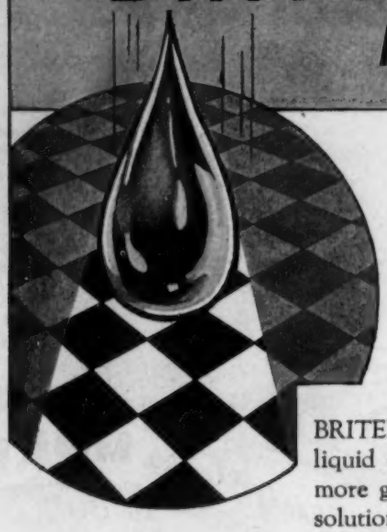

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management as it contrasts with efficiency in business in the minds of some of the industrialists. This was highspotted by the complaint that good businessmen when they get elected to school boards, immediately fall under the sway of the professional administrator, take his say-so in all respects, and become "yes men" instead of informing themselves independently and insisting that the board be a real policy-forming body and not a mere "rubber stamp." In this writer's opinion, there is no doubt that this influence exists in marked degree among otherwise intelligent lay officials of education, and much of the work of associations of school boards is to supply information and incentive to absorb it so that the best may come from the joint cooperation of school board and profession.

The second minor matter, which can easily be the major influence in the advancement or retardation of public education, was epitomized when one expert in public affairs said "You school people are very poor salesmen." Indeed, the consensus was that in order for the profession of teaching to give all it can for improvement there must be a public understanding of the responsibility of the teachers, his and her handicaps, and the unlimited possibilities before them in the way of service. But this needs the right sort of advertising of what education means to the present in the postwar world. Significantly, several of the great movements in current educational progress are being initiated, like the foregoing, by laymen and not by the profession.

Some Points Discussed

No resolutions were offered or adopted at the conference, for the reason that those present thought it would be wrong by inference to commit many nonattendants to points of view not even discussed by them. Nevertheless there was a consensus which may be indicated by brief notes taken on the four group discussions, as follows:

1. There is no question that education has its influence on production, distribution, and consumption. . . . Education should exert an influence on the right standard of living and not merely for money. . . . Education encourages the more abundant life. . . . Industry can cooperate to a greater extent to employ the best teachers for every step from primary grades through college in order to obtain the most from education. . . . In order to obtain the most in teaching industry must aid in offering the best inducements for teaching. . . . Teachers are under the same economic pressures as other people. They often receive wages which manufacturers would think insufficient for office boys. . . . As for costs, industry can contribute to better education and not miss much on net costs because of income tax deductions. . . . Children grow up to be good consumers. . . . This conference will have been worth while if it furthers the welfare of the teachers of the country. Schools could and should train for industry. The type of training which was directly responsible for our great war production should be widespread. . . . A well-trained man makes an alert employee, keen for improvement, for better employer-employee relationships. It might enable people to live through periods of low depression. . . . Our educational progress can be so planned as to make pupils eventually better consumers.

2. Schools and colleges are largely responsible for good citizenship. One way to improve would be to permit teachers to discuss controversial subjects, politics, and the like in school. This would make pupils more tolerant and respectful of others. This should begin in the home and the community. Many teachers are not competent for this task and from such the reaction on parents would be bad. Therefore it is necessary to educate both teachers and parents to a higher level. . . . At present there is no means for getting the teaching product into the eyes of the public. Merely raising wages would not be enough. . . . If the public were made fully aware of the consequences of improved teaching the necessary funds would be forthcoming. . . . It is necessary to raise the level of literacy four or five grades to a plateau or realism of understanding, appreciation, and meaning of citizenship. . . . Pupils must be able to think and analyze and have the courage to act. . . . The long-time, long-range plan should be to provide the highest type of leaders and teachers in order to raise the mass of the people to a level where they can marshal facts, analyze them, and act upon them intelligently. . . . Men of industry say the schools must inform the public, must bring home to the public the meaning of their aims.

Public School "Management"

3. The native ability of children needs better teaching and more money to do that. School boards are not giving enough time and study to their responsibilities. . . . The schools need unified management, not a separation of the authorities of management. . . . There must be district reorganization of a type which should preserve and encourage the unit system of administration. . . . Out of about 12,000 separate school districts in the state only 103 unit systems are left. . . . Reorganization will make for more efficient administration, but with the trend for general improvement there must be more money, more leadership, and more state aid. . . . Reorganization here and in other states cannot come from

(Concluded on page 78)

What DID A SCHOOL SUPERINTENDENT FROM *SOUTH CAROLINA* *Say* TO A SUPERINTENDENT FROM *NORTH CAROLINA?*

Well—we don't know for sure . . . but their conversation might have run something like this:

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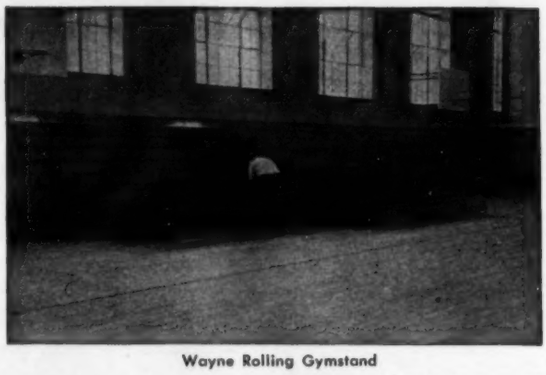

Wayne Rolling Gymstand

Permanent grandstand

Portable type "H" grandstand

(Concluded from page 76)

more taxes piled on the farms which already bear relatively higher taxes than other property. . . . We need to study and improve the methods of underassessment of property and the inequalities in assessments, and to overhaul thoroughly our whole revenue system, if district reorganization is to bring material educational improvement. . . . We can afford the best if organization and administration are efficient. . . .

4. Industry would like the pupil to know what industry is. The school should be a social institution in which he can learn work habits. . . . This means that expert guidance should begin early. Education without guidance makes pupils confused. . . . There is a considerable problem in guidance personnel. This personnel should be alert to changes in occupational fields, should inform pupils of them and thus permit the pupil to have a broad field of choice. . . . At present most money spent on adult education is for occupational training. This is not broad enough. The school should be the educational institution of the community and should continue to function for adults out of school. It should be open 24 hours a day and 52 weeks in the year. It must be available even for hobbies. . . . An adult program should not be limited to four walls or to limited periods. . . . Our war experience says we must gear into industry, must profit from the lessons learned by employers and employees and live our needs. . . . We must not think of vocations *versus* culture. Life cannot be lived separate from earning a living. Living must not be narrowed just to training for a skill but to make good workers, good men, and good citizens. Work is just as cultural as culture. Education should be based on occupational opportunity, which means keeping in touch with labor and industry. In times of depression we shall probably keep 16- and 18-year-old pupils longer in school; in boom time industry may take them earlier than otherwise. . . . Training should be comparable to real work. . . . The school must follow up the trainee and constantly adjust to keep schools up to date. . . . They must keep in touch with men after the war.

Business Wants to Cooperate

A report of such a conference could easily be open to the criticism that merely reporting it is a form of taking sides with manufacturers, other businessmen, and school-board members who come from the propertied class, unless recognition is given to the attitude of groups of teachers who are opposed to this type of cooperation. Without making an issue of it, it can be said that there are organizations whose leaders prefer to use battling tactics to gain the personal ends of their members. At the conference private conversations disclosed that here and there leaders of the cooperators were told from time to time that the educational leaders were selling out their constituents to big business. The significant aspect of this matter to this reporter is that the several groups engaged in it were wholly convinced that it pays to cooperate, that if big business is setting its attitudes to accept more taxes for education because it is good for business, the profession of education has nothing to lose in lending all its force in the same direction.

Personal News

► GEORGE E. HOGAN has been appointed Deputy Superintendent of Public Instruction for the state of California.

► JULIAN A. MCPHEE, formerly president of the California Polytechnic School, has been appointed State Director of Vocational Education.

► JOHN W. SAHLSTROM, late superintendent of schools at Elmira Heights, N. Y., died on October 13.

► CHESTER J. MILLER, late superintendent of schools at Northport, N. Y., died suddenly on November 20. He had been acting superintendent since January, 1943, when Lyle L. Morris entered the armed forces.

► RALPH W. SHEEK, of Franklin, Ind., has been elected president of the Southern Indiana Superintendents' Association.

► A memorial service was held in Springfield, Ill., for the late R. E. FILDES, superintendent of schools. Mr. Fildes passed away in a Chicago hospital where he had been a patient for several weeks. He had been superintendent in Springfield since 1937, when he succeeded the late William J. Lowry.

► FRANK S. TOBIAS, former president of the school board of Berkley, Mich., died suddenly on December 4.

► The board of education of San Francisco, Calif., has elected BART A. SUPPLE as president, and JOHN D. MCGILVRAY as vice-president.

► Keene, N. H. The school board has given SUPT. L. O. THOMPSON an increase in pay in the form of a $250 bonus to cover the balance of the fiscal year.

► E. S. DAVIDSON has been elected acting superintendent of schools at Berwyn, Ill., to succeed the late E. W. Martin who died recently.

► OSCAR A. MARTIN, formerly president of the school board at Holton, Mich., died at his home after a short illness.

► DR. CHARLES E. KELLY has been elected president of the school board at Superior, Wis.

► CONRAD HERTLEIN, president of the school board at Superior, Wis., died at his home recently.

AMERICAN ASSOCIATION OF SCHOOL ADMINISTRATORS WILL HOLD FOUR MEETINGS

The American Association of School Administrators has announced that four regional meetings will be held during the winter and spring as follows:

February 12–14, Birmingham, Ala.
February 19–21, Chicago, Ill.
February 27–March 1, Denver, Colo.
March 5–7, New York City

Exhibits will be held only at Chicago and New York. Information may be obtained from Mr. S. D. Shankland, secretary, Washington, D. C.

GYMNASIUM PLANNING AND CONSTRUCTION

(Concluded from page 28)

order for school authorities to explore and determine the immediate and future needs of the physical education plant, rather than adopt a "do-nothing" policy. Physical-education-building plans deserve the attention of specialists; architects experienced in the field, school-building consultants, and physical-education directors conversant with building problems. Postwar planning should be more than just wishful thinking, more than mere listing of projects.

Kenneth Stowell, editor of the *Architectural Record,* points the situation when he writes: "This is the time for proper study, for consideration of the pertinent factors, for reaching reasoned decisions, not snap judgments necessitated by last minute rush."[2]

Work through your state planning commissions, review your laws governing gymnasium and pool construction, and carefully consider ways and means for financing the project. Wherever possible "blueprint now" so as to be at the head of the line when materials are again available and construction is on the march.

[2]Kenneth Stowell, Editorial, *Architectural Record,* Vol. 95 (March, 1944), p. 57.

BAY CITY SCHOOL ELECTION

(Concluded from page 22)

85 per cent of the votes were affirmative, and only 15 per cent were negative. Of the 19 precincts in the city, every precinct gave the proposal a simple majority, and only two failed to give it a two-thirds majority.

The campaign, it turned out, accomplished more than the approval to raise funds. It created a unity of purpose and action seldom exhibited in any community, as shown by an editorial in the *Bay City Times:*

"Monday's election gave a money-raising proposal the most enthusiastic and lopsided endorsement any matter of its nature ever received locally. A close analysis of the vote revealed many interesting aspects of the public favor but most significant was the unity of the community as a whole. There was no evidence of opposing factions or groups working against community development because of increased costs to them. The sustained activity of the steering committee was in close harmony with the board at all times. It directed the two-way program through which was engendered a new and stimulating enthusiasm reaching into all parts of the community. This is one of the most gratifying aspects of the whole program for it served not only to revitalize an ailing system but it served to mold the entire city into a broad-minded, forward-looking unit."

SAN DIEGO CIVIL SERVICE TRAINING

A civil service training program, voted unanimously by the San Diego (Calif.) City Council, is now being worked out in conjunction with the city schools. The program will involve a training schedule designed not only for those seeking to enter city service, but also for those already employed by the city seeking to perfect themselves and others seeking promotions.

Participating in a conference outlining the scope of the training program were Willis R. McCabe, city personnel director, and Dr. Will C. Crawford, city schools superintendent.

Crawford said that when the program goes into effect it will give San Diego the most comprehensive arrangement for training public servants to be found anywhere in the nation. Details of the plan, which McCabe said had been requested by employees, were outlined by J. Graham Sullivan, director of vocational training for the city schools.

Crawford said the schools will supply a man to direct the program for the first year and that in the future it may be deemed advisable to have the post filled by the city with the director paid by the city treasury.

CALIFORNIA CAMPAIGN FOR INCREASED SCHOOL SUPPORT

The state of California, by an overwhelming vote of its people, has raised its elementary school support from $60 to $80 per pupil. The school people of the state had previously asked the legislature for extra aid, but the legislature had given the schools only an extra $6 per pupil. At a meeting of the State Council of the California Teachers' Association, it was decided to ask the people of the state for the $20 which the legislature had failed to provide. A total of 189,000 signatures were needed for the proposal and the teachers' association brought in 576,000 signatures which placed the constitutional amendment on the ballot. A committee of seven was appointed to act as campaign committee and a steering committee of ten was appointed to conduct the campaign. Four million pieces of literature were printed for distribution to voters; advertisements were run in 700 newspapers and 250 magazines, and over one million postal cards and letters were sent out.

As a result of the campaign sufficient money will be available to pay a minimum salary of $1,800 to every teacher in the state, and the support for the schools will be definite and regular.

The A.B.C. of NATIONAL

CLOCK EQUIPMENT FOR THE NATION'S SCHOOLS

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C. LOW COST

National's simplicity begins with The MOTOR that drives EVERYTHING — an electric, self-starting synchronous motor that provides CORRECT time to all units, even to the half — or quarter minute.

National Timing is dependable, because every unit — the Program Clock in the office that automatically rings the bells, — the room or corridor clock that visually indicates the passing of time, is tuned to Arlington, the Nation's Master Time Piece, just like your favorite Radio Station.

National clocks are economical, and do not require expert technicians, who often travel long distances at high cost to correct difficulties, a common experience with other types of equipment, that cannot use National synchronizing facilities, now available to everyone, absolutely Free, through your Local Public Utility.

Tune in With National, and Correct Time!

National Electric Program clocks (illustrated above) are available for one minute, 3 minute or 5 minute Interval ringing periods, with automatic week end silencing, to control from one to 4 different schedules.

For full information and prices write for Bulletin No. 137.

ROOM AND CORRIDOR CLOCKS

National individual clocks for schools are motor driven — require no special wiring, — just plug into your 115 volt A.C. light socket supply. Single face clocks for rooms, with 10", 12", 15" or 18" dials, and double faced wall or ceiling mounted for corridors, with 12", 15" or 18" dials.

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"Your locks are all you said they were"

"Your locks have turned out to be all you said they were. We have had practically no trouble with them in the four years they have been in hard usage here. It is surprising to me the way they hold. The Dudley is a wonderful lock."
Automatic, self-locking and easily operated, Dudley locks are preferred by the majority of executives, teachers and students.
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Give best prices "as is," f.o.b. point of purchase. May I hear from you?
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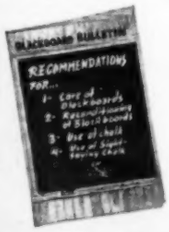
TODAY'S CHILDREN BENEFIT FROM YESTERDAY'S RESEARCH!



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Publications for School Business Executives

State Tax Legislation Affecting School Revenues, 1939–1943

Bulletin No. 3, October, 1944. Published by the Research Division of the National Education Association, Washington, D. C.

This bulletin, the third on state tax laws affecting public schools, deals only with legislation which in the period of 1939 to 1943 made some contribution to state school revenues. Among the types of taxes treated are income taxes, inheritance, estate and gift taxes, general sales and use taxes, severance taxes, chain-store taxes, corporation taxes, and property taxes.

Long Standing Dominance of State Educational Authority

By Calvin Grieder. 20 pages. Reprint from Educational Administration and Supervision, Baltimore, Md.

This account of state school administration from the historic standpoint infers the need of strengthening the nonpolitical and professional character of the state superintendency and the development of the state boards of education.

Wartime Municipal Debt Administration

A series of four authoritative articles on current and postwar policies, bond issues, and refunding in November, 1944, issue of *Municipal Finance* (50 cents), Chicago.

Statistics of State School Systems, 1939–1942

Vol. II, Chap. III. By David T. Blose and Henry F. Alves. Paper, 138 pages. U. S. Office of Education, Washington, D. C.

This report, which has been long delayed, includes the data for 1939–40 and 1941–42, which is combined in one volume. The chapter presents data on public elementary and secondary schools in 48 states and the District of Columbia for the school years 1939–40 and 1941–42, together with comparisons extending over the 70-year period of state school statistics.

Plans for Federal Taxes After the War

Paper, 13 pages. Bulletin for November, 1944. National Education Association, Washington 6, D. C.

A report on three comprehensive plans for a postwar federal tax system, including (1) the Twin Cities Plan, (2) the Beardsley Ruml Plan, and (3) the Groves Plan. Teachers will be interested in the main features of these plans and in the arguments favoring or opposing them.

City Finances for Cities over 25,000 Population, 1942

Prepared by E. R. Gray. Paper, 224 pages. United States Government Printing Office, Washington, D. C.

A statistical compendium giving the financial statistics for cities over 25,000 population.

Journal, Royal Architectural Institute of Canada

Vol. 21, No. 11, November, 1944. Published by the Institute at Toronto, Ont., Canada.

Special School Building Construction Issue, with technical papers on the planning of nursery schools, elementary schools, and secondary schools, and with illustrations of recently completed buildings. Additional articles discuss heating and ventilation, lighting, and acoustics.

Community School Plans

Paper, 20 pages. Issued by Interstate School Building Service, Peabody College for Teachers, Nashville 4, Tenn.

This collection of typical plans for southern rural and village situations includes two-, three-, four-, six-, and eight-teacher buildings for all of which blueprints and specifications are available. Layouts for typical primary and intermediate classrooms; science, homemaking, shop, cannery, library, and lunch rooms.

Study of Two-Mill Property Tax Levy for High School Aid

Published by the Wisconsin Taxpayers Alliance, 116 West Washington Ave., Madison 3, Wis.

A study of the high school aid property tax levy, showing how each town, village, and city in each county would gain or lose if the tax levy were approved by the voters. The facts were gathered by the Alliance and presented without any definite recommendations for or against the proposal.

Statistics of Higher Education, 1939–1942

By Henry G. Badger, Frederick J. Kelly, and Lloyd E. Blauch. Paper, 295 pages. Published by the Federal Security Agency, U. S. Office of Education, Washington.

This report for the years 1939–40 and 1941–42 includes the statistical data on personnel, enrollment, degrees, fiscal debt on property, endowments, and costs.

The Lighting of Schools

Paper, 14 pages. Lighting Reconstruction Pamphlet No. 3. Issued by the Illuminating Engineering Society, 32 Victoria St., London, S.W.1, England.

A helpful article, offering general considerations for those concerned with lighting problems of reconstruction.

Perspective

Generations of children have "gone to school" in Eberhard Faber's 95 years.

There have been "war shortages" before . . . now, as then, Eberhard Faber holds to unwavering standards of quality in the products we are able to make.

So too, when *this* war has become an "assignment" in school histories, the responsible buyers of school supplies will still safeguard quality by specifying EBERHARD FABER.

New Supplies and Equipment

Production, Service, and Sales News for School Buyers

SCREENS DESIGNED FOR SCHOOL USE

Pictures projected on new Radiant, "Hy-Flected" glass-beaded screens are declared to have unusual brilliance, depth, and color. Motion pictures, slides, and slide films show up vividly and clearly with marked contrast.

Thousands of tiny optical glass beads, firmly embedded in the snow-white surface, reflect light instead of absorbing it, and are responsible for the startling efficiency of these screens. Visual aids become more efficient when used with these perfected radiant screens.

The new Radiant, portable classroom screens incorporate features making them uniquely convenient. Tripod legs can be set in any position for wide or narrow spread, without set screws or plungers. Square-size screens for slide or strip films are convertible to oblong size by merely raising or lowering the screen to an indicated point. Model DS permits raising and lowering to any position by means of a new "auto-lock."

The Radiant Mfg. Corporation also produces a complete line of wall and ceiling screens measuring from 30 by 40 inches to 20 by 20 feet.

Radiant Mfg. Corp., 1140-46 West Superior St., Chicago 22, Ill.

For brief reference use ASBJ—110.

LYON BLUEPRINT CABINETS

After America's entry into the war, the manufacture of steel blueprint cabinets was stopped. Because of the restrictions, many institutions using large quantities of blueprints, charts, tracings, and photographs, were forced to seek other less secure methods of safe, flat storage. The

situation was not improved when it was found that substitute materials for the construction of blueprint cabinets could not be used effectively because they were not fire resistant.

Users may again secure steel blueprint cabinets. The Lyon Blueprint Cabinet is especially designed for safe, flat storage of valuable drawings, tracings, blueprints, charts, photographs, and other large papers. The cabinet has a rigid frame for continuous perfect alignment of drawers. The drawers are equipped with handy handles and label holders, and can be divided in different ways by standardized and interchangeable partitions. Sections may be placed one on top of the other, and a sanitary (open) or closed base may be used. No finishing top is required. Cabinets are finished in green baked enamel for beauty and durability. Catalog No. 331.

Lyon Metal Products, Inc., General Offices, Aurora, Ill.

For brief reference use ASBJ—111.

NEW "SLIMLINE" LAMPS

A new line of four extremely "thin" fluorescent lamps — the longest unit measuring only one in diameter and nearly eight feet in length has been announced. Included in the new line, called the "General Electric Slimline Mazda Fluorescent Lamps," are two ¾-inch-in-diameter sizes — one approximately 3½ feet long, the other slightly more than 5 feet in length — and another 1 inch in diameter lamp approximately 6 feet long. Addition of this "slimline" to the present line of G-E Mazda F lamps will, it is believed, provide the tools necessary to satisfy almost every lighting need. Diameters of the two longest lamps in the new Slimline are each approximately one half those of the popular 40 watt and 5 foot 100 watt sizes, respectively, in the present G-E lamp line.

General Electric Co., Nela Park, Cleveland, Ohio.

For brief reference use ASBJ—112.

AIR-AGE MAP FOR EDUCATORS

Educators, teachers, and others interested in the coming era of air transport may now secure copies of an animated world map. Lithographed in six colors, the map "Routes of the Flying Clipper Ships" delineates the nearly 100,000 miles of global air routes operated by Pan American World Airways. In addition to including the routes, the map is embellished with figures and symbols representative of the various areas of the world. The artist, Leon Helguera, is a nationally known Mexican illustrator, who designed the now-famous two-cent United Nations stamp of the United States. The basic map is by Richard Edes Harrison and is a novel presentation of the globe in that it permits 100 per cent of the world's area to appear on one surface.

Educational Director, Pan American, 135 East 42nd St., New York, N. Y.

For brief reference use ASBJ—113.

U. S. OFFICE OF EDUCATION FILMS

Fourteen new motion pictures to aid in the training of war-production workers in vocational schools and war industries have been released by the U. S. Office of Education. The new films cover such subjects as aircraft maintenance, pipe fitting, welding, and engineering. One of the pictures shows how to calculate proportion, percentages, squares, and square roots on a slide rule. A previously released Office of Education film shows how to multiply and divide on a slide rule. In addition to the motion pictures, film strips, which review and clarify important points in the films, and instructors' manuals, which describe the best ways of using the visual materials, are also available. Motion picture, film strip, and manual form an "instructional unit of visual aids." Instructors' manuals are furnished without charge to users of films.

Castle Films, Inc., 30 Rockefeller Plaza, New York City, N. Y.

For brief reference use ASBJ—114.

FARADAY CATALOG NO. 61

In designing Faraday's new catalog only good photographs portraying merchandise as it really is have been used. Type easy to read and giving an up-to-date appearance has been employed. One feature is the quick-find index system. A guide to Good Signaling helps the buyer to select the proper type of signal. Many interesting facts about sound measurements are included. Much engineering data and many wiring diagrams will be found. Tables of electrical characteristics are set up so that they are literally an index to anyone seeking complete information. Many items have been added and many have been redesigned.

Faraday Electric Co., Adrian, Mich.

For brief reference use ASBJ—115.

COLOR DYNAMICS

According to studies made on the subject of color dynamics, it is a perfectly simple matter to obtain three primary objectives — one, to promote continuity of employment — two, to improve efficiency — three, to maintain higher morale. Generally speaking, color dynamics is based on principles directly opposed to camouflage practices. To camouflage an object, color is used to hide and obscure. In color dynamics, color is used to high light, reveal, and emphasize. There are three major steps to be taken in the application of the principles of color dynamics — focal working areas, walls and ceilings, and floors and aisles. By applying the science of color dynamics to each of these, absenteeism is reduced, fewer injuries result, better morale and a higher level of quality are maintained. The Pittsburgh Color Dynamics Book treats thoroughly with this entire subject and is available on request.

Pittsburgh Plate Glass Co., 632 Duquesne Way, Pittsburgh 22, Pa.

For brief reference use ASBJ—116.

POSTWAR ADJUSTABLE STEEL CHAIRS

The new Kewaunee Chair has many outstanding features. The seat height may be changed instantly to suit any individual. Four height ranges are available, in either stool or chair, from 12 to 15 in., 15 to 21 in., 18 to 27 in., 24 to 36 in. The shaped steel backrest may be adjusted both vertically and horizontally in relation to the seat. The most popular height range is 18 in. minimum to 27 in. maximum. This one chair gives a variance of seating heights covering most needs. Adjustment is made by merely lifting the seat. No bolts, nuts, or screws are used. No tools are needed, adjustments are entirely automatic. Shipments may be expected shortly after January 1, 1945.

Kewaunee Mfg. Co., Dept. 000, Adrian, Mich.

For brief reference use ASBJ—117.

ELECTRONIC DUO-STAT BOOKLET

Pneumatronics is an unique coverage of a new term in temperature control. A booklet 8½ by 11 — 12 pages — fully illustrated refers to Johnson Electronic Duo-Stat a new form of the familiar Duo-Stat oldest weather — compensated heat controller. Modern electronic circuits have been applied to control temperatures. The entire line of Johnson control is not to be electronic type, special electronic regulators now being manufactured will be produced more widely after the wars.

Pneu-ma-tron-ics, as defined by the company, is a combination of the best in electronic temperature equipment (including the Electronic Duo-Stat) used in conjunction with pneumatic operators. Pneumatronic Principles may be applied profitably to certain types of automatic temperature control problems. Pneumatronic temperature controls have been in actual use for over three years and for the duration are available for a limited number of additional applications.

Johnson Service Co., 507 E. Michigan St., Milwaukee 2, Wis.

For brief reference use ASBJ—118.

HERITAGE FOR VICTORY

As part of the seventy-fifth anniversary observance, the Western Electric Company have produced a feature length motion picture entitled *Heritage for Victory*. The picture dramatizes the growth of the organization over three quarters of a century and demonstrates the cumulative skill, technique, and experience gained through 75 years. Today, no U. S. pilot takes to the air without the support of some Western Electric essential. Radio sets from the skilled hands of telephone makers plunged across the Siegfried line in U. S. tanks. Electrical gun directors, containing elements from nearly all of the company's dozens of manufacturing sites, helped to blunt the counterattacks of the Luftwaffe and to transform many a buzz bomb into a harmless puff of smoke. In the motion picture, *Heritage for Victory*, the results of these miracles of peacetime technology-armed-for-war are shown in battle-front action on land and sea and in the air helping our fighting men speed the day of peace.

Western Electric Co., 195 Broadway, New York 7, N. Y.

For brief reference use ASBJ—119.

NEW MODEL HYGEAIRE

American Sterilizer Company, Erie, Pa., has recently placed on the market a new model "Hygeaire" unit for air disinfection. It differs from the original model in its shape and general appearance — the result of its having been streamlined. This unit of "Hygeaire" system employs a G.E. Germicidal Tube to project intensified ultraviolet rays across living or working areas above eye level. A scientifically designed reflector provides both optimum intensity and diffusion of the rays that are lethal to airborne bacteria. The unit may be recessed into the wall, or wall or ceiling suspended. Because more than 85 per cent of the ultraviolet energy output of this new unit is of the germicidal wave length (2537 Angstroms) it will assist industry in combating absenteeism caused by cross infection in offices and plants.

The Graybar Electric Company, 420 Lexington Avenue, New York 17, N. Y.

For brief reference use ASBJ—120.

CHAMBERLIN CHANGES NAME

The name of the Chamberlin Metal Weather Strip Company has been changed to Chamberlin Company of America. According to J. P. Glaser, executive vice-president, the change was made in keeping with the company's greatly expanded line of products and services, which in addition to weather strips, includes rock wool insulation, storm windows, calking, insect screens, and detention screens for hospitals and psychiatric institutions.

HENRY N. FRANKENFIELD

After two years service in the Army, including some exciting experiences in the Persian Gulf Operations, Mr. Frankenfield has returned to Hunt Pen Co., Camden, N. J., to resume his work as developing engineer. Mr. Frankenfield will be remembered for his interesting and instructive books on Linoleum Block Printing and his development of this subject for art education in the schools.

CHILDREN GET BELL & HOWELL MOVIE EQUIPMENT

School children in Spokane, Wash., will continue to enjoy a high standard of education even though there's a war on. By virtue of a government priority allotment, J. M. Tweinkel, assistant superintendent of Spokane's public schools, recently accepted delivery on eight brand new Filmosound movie projection outfits for use in the city's visual education program. Through the combined foresight of the equipment manufacturers — most of whose efforts currently are devoted to vital war work — and the W.P.B. — whose officials realize keenly the necessity of allotting equipment for educational activities — American youth today is enjoying the most well-rounded learning facilities in the nation's history.

FLUORESCENT LIGHTING CONSULTANTS

Van Doren, Nowland, and Schladermundt, industrial designers, New York City, have been appointed by The F. W. Wakefield Brass Co., Vermilion, Ohio, manufacturers of lighting fixtures since 1906, as consultants on new fluorescent lighting equipment. Harold Van Doren is widely known in the industrial design field and is the author of *Industrial Design*. In a previous connection he designed the Commodore line of lighting fixtures for Wakefield. President A. F. Wakefield states the new models will appear in 1945.

PLAQUE AWARDED

Recognition of Whitefish Bay, Wis., High School for having one of the 40 finalists in the 1944 national Science Talent Search competition was given on November 21, 1944, when a bronze plaque was awarded to the school at a special program. Royal M. Corr, who was graduated from the Whitefish Bay High School last spring, was awarded a trip to Washington and scholarship as a finalist in the competition which was entered by more than 15,000 high school seniors. The plaque was accepted for the school by Royal's twin sisters who are students at the school. The plaque as recognition of the achievement was awarded by Science Clubs of America, which administers the search, and the Westinghouse Electric & Mfg. Co., which sponsors it and awards scholarships totaling $11,000.

THE KEWANEE BOILER COMPANY

A letter received by the Kewanee Boiler Co., at Kewanee, Ill., reads: "I am pleased to inform you that you have won for the fourth time the Army-Navy Production Award for outstanding achievement in producing materials essential to the war effort. By maintaining the distinguished record which previously brought you distinction, you are once again proving your leadership on the production front. This third White Star added to your Army-Navy Production Award flag carries with it the thanks and congratulations of our Armed Forces." [Signed] *Robert P. Patterson, Under Secretary of War.*

JOSEPH C. SINDELAR, PASSES

Mr. Joseph C. Sindelar, who for many years has been president of Beckley-Cardy Company of Chicago, and more recently also president of the E. W. A. Rowles Company of Arlington Heights, Ill., passed away after lingering effects of a serious automobile accident sustained last March. Mr. Sindelar was born November 21, 1885, and died December 1, 1944. He was widely known and highly regarded in the schoolbook publishing and school furnishing fields.

SCHOOL-BOND SALES

During the month of November sales of school bonds in the amount of $2,058,000 were reported. The interest rate averaged 1.63 per cent.

The excellent status of current school funds was reflected in the small sales of short-term paper and refunding bonds amounting to $561,000.

SCHOOL-BUILDING CONSTRUCTION

During the month of November, 1944, in 11 states west of the Rockies, contracts were let for 12 school buildings, to cost $761,170. Projects in preliminary stages were reported in the number of 29, to cost an estimated $1,378,220.

Dodge reports that in 37 states east of the Rocky Mountains, contracts were let in November, 1944, for 242 educational buildings. The cost of these buildings will be $5,286,000.

FLOORING PRICES INCREASED

The OPA has announced that producers of maple, birch, and beech flooring may increase their prices by 2 per cent, except in the Southern, South-central, and Appalachian hardwood regions. Northern hard maple flooring has increased to $105 for first grade, to $99.50 for second grade, and $82 for third grade.

SHEETING AVAILABLE

WPB has issued instructions under which service trades and governmental agencies and institutions may obtain sheeting. A total of 5,115,000 yards of sheeting (Class A and B) has been allotted for these uses by state and local governmental agencies, schools, hospitals, colleges, orphanages, and other institutions.

Applications will be received on a pro rata basis, calculated on the actual consumption of the materials by the applicant in the third quarter of 1944.

NEW SEMINAR PROGRAM

The School of Education of the Pennsylvania State College, at State College, Pa., has announced a new seminar on reading disabilities to be held from January 29 to February 2, 1945. Dr. Emmett A. Betts, an expert in the subject, will act as leader.

COMING CONVENTIONS

January 10–13. Association of American Colleges, at Atlantic City, N. J. Dr. Guy E. Snavely, 19 West 44th St., New York, N. Y.

February 2–3. American Education Fellowship, at New York City. V. H. Tibbetts, New York, N. Y.

February 19–21. American Educational Research Association, at Chicago, Ill. Daniel Segel, secretary, Washington, D. C.

February 21–24. National School Service Institute, at Chicago, Ill. Lew E. Parmenter, secretary, Palmer House Shops, Chicago, Ill.

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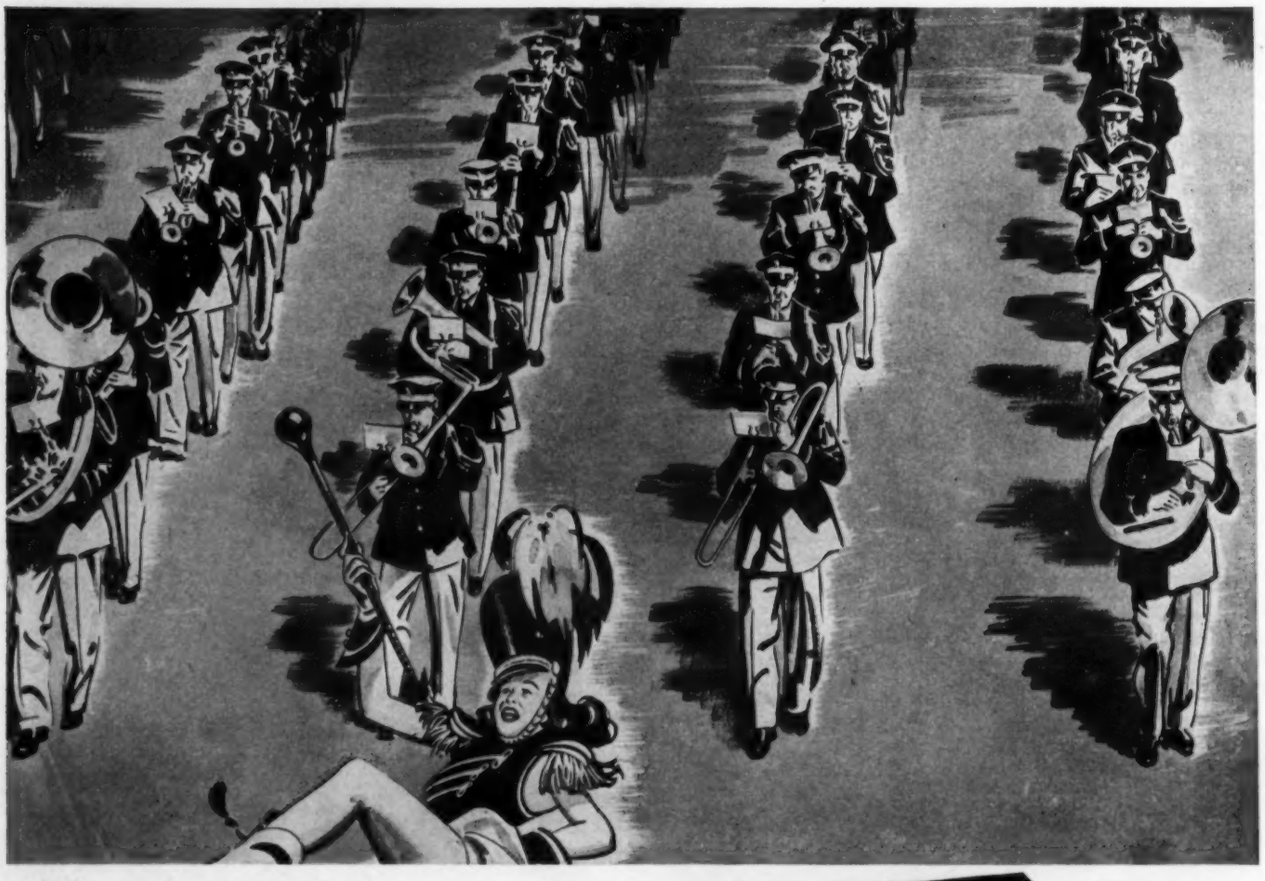

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